APPENDIX I

METHODOLOGY FOR CALCULATING AND ALLOCATING THE ALLOWABLE BACTERIA LOADS TO IMPAIRED BEACHES AND CREEKS

This appendix describes the methodology for calculating and allocating the allowable bacteria loads to impaired beaches and creeks. Part I discusses the wet weather analysis from which interim TMDLs and allocations were derived. The wet weather interim analysis used single sample WQOs as interim numeric targets and incorporated the reference system approach discussed in section 4 of the Technical Report. Part II discusses the wet weather analysis from which final TMDLs and allocations were derived. This analysis used single sample WQOs as final numeric targets and did not incorporate the reference system approach. Part III discusses the dry weather model and the use of both interim and final numeric targets.

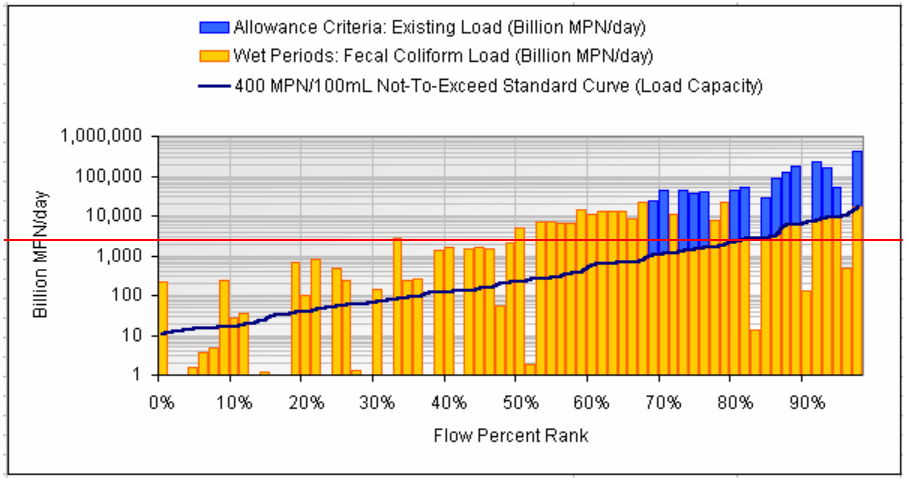
I. Calculation of Allowable Loads Using Interim Numeric Targets for Wet Weather Analysis

For the wet weather analysis, allowable loads were calculated using the Loading Simulation Program in C++ (LSPC) watershed model. Model output was used to produce load duration curves[1] for the critical condition, defined as the 92nd percentile wet year of 1993. These curves were used to calculate the allowable loads that would not result in an exceedance of the numeric targets on more than 22 percent of the wet days in a year. The exceedance frequency of 22 percent was derived from a reference system in Los Angeles County. The methodology for allocating the allowable loads for each watershed is described below, along with a sample calculation showing all the steps involved.

1. Quantify Current Bacteria Loads and TMDLs

The LSPC model described in Appendix J was used to predict bacteria loading to each of the impaired subwatersheds (watersheds were delineated into smaller subwatersheds for loading analysis). For each subwatershed, model predicted loads were used to construct load duration curves for each of the three indicator bacteria. A sample load duration curve is shown in Figure I-1. This load-duration curve, or bar graph, shows model-calculated fecal coliform loads for one of the Aliso Creek subwatersheds (identified as subwatershed number 202).

[1] Load-duration curves display modeled daily loads ranked according to the magnitude of the modeled average daily flow associated with the load for a specific location. The height of the bars corresponds to the magnitude of the bacteria load (billion MPN). Appendices O and P show load-duration curves for each impaired subwatershed, for each type of bacteria.



Fecal Coliform Loading Summary	Value	Units
Wet Day Exceedances	49	None
Allowable Wet Day Exceedances	15	None
Excess Wet Day Exceedances	34	None
Total Load for Existing Condition (Total Load)	1,732,709	Billion MPN/Year
Non-allowable Exceedance Load (Exceedance Load)	170,116	Billion MPN/Year
Allowable Load = (Total Load - Exceedance Load)	1,562,594	Billion MPN/Year
Percent Reduction Required from Existing Condition	**9.8%**	**Percentage**

~~*Figure I-1. Aliso Creek Subwatershed 202*~~

~~The load-duration curve shows model-predicted bacteria loads for the critical condition for this specific location. The loads are presented on the bar graph in order of the percentile of the average daily flow associated with the load. The height of the bars indicates the number of fecal coliform colonies corresponding to the flow on a given day. The dark line running across the bar graph (referred to as the "numeric target line") represents the total maximum bacteria load that would not result in an exceedance of the numeric target for the flow on that day. This load is the numeric target multiplied by the flow (as the flow increases, the maximum load increases; but the numeric target stays constant). The blue-colored bars correspond to the 22 percent exceedance frequency allowed for natural sources (discussed in step 3 below).~~

~~The summation of the loads below the numeric target line represents the loading capacity of the waterbody on an annual basis that will not cause numeric targets to be exceeded. The blue bars above the lines represent the reference system loading capacity of the waterbody on an annual basis that will not cause the numeric targets to be exceeded on more than 22 percent of the wet days. The sum of the loads below the line and the reference system loads are equal to the allowable loads, or total maximum annual wet weather loads, for the subwatershed.~~

~~Load-duration curves are useful for quantifying the total load for existing conditions (during the critical period), and the allowable loads that must not be exceeded in order to attain WQOs. The required load reduction is the difference between these two benchmarks. The methodology used to quantify the percent reduction needed in each watershed is discussed in step 2.~~

2.Calculate Percent Reduction Required Per Watershed

The percent reduction required for each watershed was calculated by the following equation. Note that all loads are annual loads.

$$\text{Percent Reduction} = \frac{(\text{Total Load for Existing Condition} - \text{Allowable Load})}{\text{Total Load for Existing Condition}}$$

For the Aliso Creek watershed, the percent reduction is first obtained by totaling the results from each subwatershed. The Aliso Creek watershed is comprised of subwatershed numbers 201 and 202. In the following equations, "Total Load for Existing Condition" has been abbreviated to "Total Load." Numerical values are obtained from the charts associated with the load-duration curves.

$$\text{Total Load} = (\text{Total Load})_{\text{Subwatershed 201}} + (\text{Total Load})_{\text{Subwatershed 202}}$$
$$= 19{,}386 \text{ billion MPN/mL} + 1{,}732{,}709 \text{ billion MPN/mL}$$
$$= 1{,}752{,}095 \text{ billion MPN/mL}$$

$$\text{Allowable Load} = (\text{Allowable Load})_{\text{Subwatershed 201}} + (\text{Allowable Load})_{\text{Subwatershed 202}}$$
$$= 16{,}480 \text{ billion MPN/mL} + 1{,}562{,}594 \text{ billion MPN/mL}$$
$$= 1{,}579{,}074 \text{ billion MPN/mL}$$

Percent reduction required for the Aliso Creek watershed is:

$$\text{Percent Redution} = \frac{(1{,}752{,}095 \text{ billion MPN/mL} - 1{,}579{,}074 \text{ billion MPN/mL})}{1{,}752{,}095 \text{ billion MPN/mL}}$$

$$\text{Percent Reduction} = 0.0987$$
$$= 9.9\ \%$$

The required wet weather reduction for fecal coliform in the Aliso Creek watershed using numeric targets with a reference system approach is 9.9 percent.

3.Quantify Allowable Exceedance Loads

Allowable exceedance loads attributed to natural sources (feces from birds and other wildlife) calculated using the reference system exceedance frequency are represented by the blue-shaded bars in the load-duration curves reported in Appendix O. Under the reference system approach, a 22 percent allowable exceedance frequency of the wet weather numeric targets was used to calculate allowable exceedance loads.

For each watershed, the number of wet days in 1993 was documented (Technical Report, Table 8-1). The number of days that exceedances of numeric targets are allowed for each particular watershed is obtained by multiplying the number of wet days by the exceedance frequency (Table 8-2). For the Aliso Creek watershed, the number of allowable exceedance days is:

69 Wet Days * 0.22 = 15 Allowable Exceedance Days

The allowable exceedance load was calculated by summing the loads associated with the allowable exceedance days. The days with the highest loads were chosen as the allowable exceedance days because the highest loads in most of the watersheds correspond to open space land uses where bacteria loads are generated from natural sources. The allowable exceedance loads are shown as blue bars on the load-duration curves. Although the blue bars are in exceedance of the numeric targets (magnitude is above the line), these loads are considered uncontrollable, and not likely to be associated with human pathogens. The remaining orange bars with magnitudes above the line represent exceedance loads caused by anthropogenic sources. These loads must be reduced. The allowable load is equal to the total load for existing conditions (total load) minus the non-allowable exceedance loads caused by anthropogenic sources.

The allowable load must be allocated to sources. The following steps deal with the allocation of the allowable loads to point and nonpoint sources.

4. Classify Land Use Categories as Point or Nonpoint Sources, and Classify Nonpoint Sources as Controllable or Non-Controllable

For purposes of implementation, all land use categories were classified based on whether they generated point or nonpoint sources of bacteria. Nonpoint source land use categories were further divided into controllable or non-controllable sources. The classification of a land use as generating either point or nonpoint sources, and controllable or non-controllable sources, was based on the likelihood that the land use was urban and would occur in an area drained by MS4s, or was rural and outside of MS4 drained areas. The rationale for identifying specific responsible dischargers is discussed in the Technical Report, sections 10 and 11.

Point sources are defined as "any discernable, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged" [CWA section 502(6)]. Bacteria loads from point sources include discharges from the following land use types:

- Low Density Residential;
- High Density Residential;
- Commercial/Institutional;
- Industrial/Transportation (excluding areas owned by Caltrans)
- Caltrans;
- Military;
- Parks/Recreation; and
- Transitional (construction activities).

Bacteria loads from these land use types were classified as point sources because, although they may be diffuse in origin, these land uses are typically found in urbanized areas, and the pollutant loading is transported and discharged to receiving waters through

~~municipal separate storm sewer systems (MS4s). MS4s are considered point sources because they discharge waste out of a discrete pipe. The principal MS4s contributing bacteria to receiving waters are owned or operated by either municipalities located throughout the watersheds or Caltrans. Municipal and Caltrans MS4 discharges are regulated separately under different NPDES requirements. For this reason, in each watershed, a separate wasteload allocation (WLA) was developed for both the municipalities and Caltrans.~~

~~Bacteria loads from nonpoint sources include discharges from the following land use types:~~

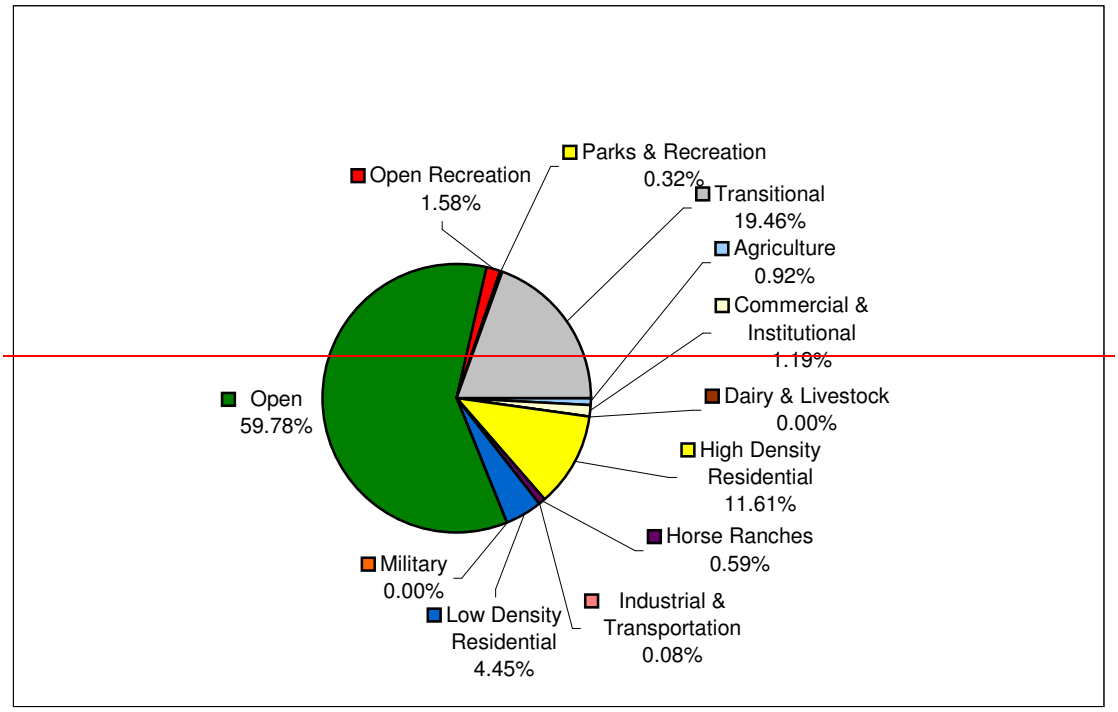
- ~~Agriculture;~~
- ~~Dairy/Intensive Livestock;~~
- ~~Horse Ranches;~~
- ~~Open Recreation;~~
- ~~Open Space; and~~
- ~~Water.~~

~~Bacteria loads from these land use types were classified as nonpoint sources because bacteria-laden discharges from these land uses are diffuse in origin, and originate in areas without constructed (man-made) MS4s. Nonpoint sources have been separated into controllable and non-controllable categories. Controllable sources include those found in the following land use types: agriculture, dairy/intensive livestock, and horse ranches. These are considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. For implementation purposes, controllable nonpoint source discharges are recognized as originating from agricultural and livestock operations. For this reason, these types of discharges are given LAs and are required to reduce their bacteria loads if they constitute more than 5 percent of the total TMDL (see Technical Report, section 10).~~

~~Non-controllable nonpoint sources include loads from open recreation, open space, and water land uses. Loads from these areas are considered non-controllable because they come from natural sources (e.g. bird and wildlife feces) rather than anthropogenic sources. LAs from these sources have been developed, but there are no accompanying load reductions expected since these sources are natural, largely uncontrollable, and regulation is not warranted.~~

~~5.Quantify Bacteria Load Distributions by Land Use Type~~
~~The sum of all bars in the load-duration curves provides an estimate of the total load expected during the critical condition (rainfall conditions documented in 1993). The watershed model was used to calculate the contribution from each land use type to the TMDL load. Land uses were divided into 13 land use categories (see Appendix J for discussion). For each watershed, for each type of indicator bacteria, model results were used to determine the load distribution by land use category. These distributions were expressed as a percent of the total load, and are displayed in pie charts like the one shown~~

~~in Figure I-2. Pie charts for each watershed are presented in Figures I-4 through I-39. For the Aliso Creek watershed, the fecal coliform allowable load was allocated to the land use categories according to these percentages.~~



~~*Figure I-2. Load Distribution of Fecal Coliform by Land Use in the Aliso Watershed*~~

~~6.Distribute Allowable Load among Land Uses~~

~~Using the pie charts described in step 5, the allowable load for each watershed was allocated to land use categories in proportion to the distributions shown in the pie charts. For example, the allowable load for fecal coliform in the Aliso Creek subwatershed was calculated from step 2 to be approximately 1,579,074 billion MPN/year. The relative contribution of fecal coliform from the High Density Residential land use, as seen in Figure I.2 is 11.6 percent. Therefore the allocation for this land use category is~~

~~Allocation for High Density Residential = 1,579,074 billion MPN/year * 11.6%~~
~~= 183,330 billion MPN/year~~

~~The distribution of the allowable load, or allocations, in the Aliso Creek watershed for all the land use categories using this methodology are shown in Tables I-1 and I-2. Table I-1 shows the allocations for the land uses associated with point source discharges, and Table I-2 shows the allocations for land uses associated with nonpoint source discharges.~~

*Table I-1. Distribution of Allowable Load amongst **Point Source** Discharges in the Aliso Creek Watershed Using Interim Numeric Targets*

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/Trans-portation	Military	Parks/Rec	Transitional	Allowable Load
Aliso Creek	% Load	4.5%	11.6%	1.2%	0.1%	0.0%	0.3%	19.5%	100%
	Load (Billion MPN/Yr)	70,269	183,330	18,791	1,263	0	5,053	307,288	1,579,074

*Table I-2. Distribution of Allowable Load amongst **Nonpoint Source** Discharges in the Aliso Creek Watershed using Interim Numeric Targets*

Watershed	Measure/Unit	Agriculture	Dairy/Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Allowable Load
Aliso Creek	% Load	0.9%	0.0%	0.6%	1.6%	59.8%	0.0%	100%
	Load (Billion MPN/Yr)	14,527	0	9,317	24,949	943,970	0	1,579,074

Tables I-9 through I-11 show the percent loads and distribution of the allowable loads for the remaining impaired watersheds. This exercise was performed for all three types of bacteria.

7.Separate Caltrans Allocation from Industrial/Transportation Land Use

Discharges from Caltrans highways are regulated under different NPDES requirements than discharges from municipal storm drain systems. Thus, a separate wasteload allocation was needed for Caltrans discharges. Caltrans land use areas were not delineated in the GIS data used in the wet weather modeling analysis. Thus, relative loads contributed by Caltrans could not be extracted directly from the watershed model results. To calculate an allocation for Caltrans, the area occupied by impermeable Caltrans owned highway surfaces was expressed as a percent of the total area occupied by the Industrial/Transportation land use, for each watershed. The area occupied by Caltrans in each of the impaired watersheds was provided by Caltrans (Richard Watson, Caltrans, personal communication, September 23, 2005) as shown in Table I-3.

Using this information, the load associated with the Industrial/Transportation land use was divided into two allocations; one to the municipalities and one to Caltrans based on the percent of the total industrial/transportation land use area occupied by impermeable Caltrans' highways.

Table I-3. Caltrans Occupied Areas in Each Impaired Watershed

Watershed	Caltrans Occupied Area (sq miles)
Laguna/San Joaquin	0.19
Aliso Creek	0.17
Dana Point	0.06
San Juan Creek	0.73
San Clemente	0.18
San Luis Rey	1.17
San Dieguito	0.78
Chollas	0.57
San Diego River	1.94
Miramar	0.74
Scripps	0.00
San Marcos	0.01

An example calculation for the Aliso Creek watershed is shown below.

Industrial/Transportation land use area = 0.89 sq miles (Table J-1 in Appendix J)

Caltrans occupied area = 0.17 sq miles (Table I-3)

The percent of the Industrial/Transportation land use area that is occupied by Caltrans is:

$$\frac{0.17\ sq\ miles}{0.89\ sq\ miles} = 0.19 = 19\%$$

The allocation for Caltrans was obtained by multiplying the percent area occupied by Caltrans by the allocation for the Industrial/Transportation land use:

Caltrans allocation = (percent of land use occupied by Caltrans) * (allocation for Industrial/Transportation land use)
= 0.19 * 1,263 billion MPN/year
= 240 billion MPN/year

For three watersheds, Laguna/San Joaquin, and Dana Point, the Caltrans occupied area was reported as being larger than the area reported for the Industrial/Transportation land use. The Caltrans data are more current (2005) than the GIS land use data (2000), thus, the discrepancy is most likely due to new highway construction since 2000 by Caltrans in these watersheds. In these cases, the allocation calculated for the Industrial/ Transportation land use was allocated solely to Caltrans.

~~The allocations for Caltrans resulting from the above methodology in the remaining watersheds are shown in Tables I-15 through I-20.~~

~~8.Combine Loads by Point or Nonpoint Source Classification~~
~~After the allowable load was allocated among all land use categories (sources) in steps 6 and 7, the allocations were then combined according to their classification as point source, controllable nonpoint source, and non-controllable nonpoint source (except Caltrans, which remained distinct). The allocations were calculated by the following equations:~~

~~Waste Load Allocation for municipal MS4s~~	~~= Sum of allocations for Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation (excluding Caltrans), Military, Parks/Recreation, and Transitional~~
~~Waste Load Allocation for Caltrans~~	~~= Allocation calculated from step 7~~
~~Load Allocation (Controllable)~~	~~= Sum of allocations from Agriculture, Dairy/Intensive Livestock, and Horse Ranches~~
~~Load Allocation (Non-controllable)~~	~~= Sum of allocations from Open Recreation, Open Space, and Water~~

~~Discharges were grouped in four categories for implementation purposes. The allocations developed for municipal MS4s will be regulated primarily via one mechanism, specifically under NPDES requirements for MS4s (San Diego Water Board Orders Nos. 2001-01 and 2002-001). The Caltrans allocation will be regulated under NPDES requirements issued to Caltrans by the State Water Resources Control Board (Order No. 99-06-DWQ). The load allocation for controllable non-point sources will be regulated primarily by WDRs, waivers of WDRs, or discharge prohibitions pursuant to the SWRCB *Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program*. Section 11 of the Technical Report discusses implementation of the TMDLs.~~

~~The results from allocating the allowable load to the different land use types, then combining the loads into 4 general discharge categories in the Aliso Creek watershed are shown in Table I-4.~~

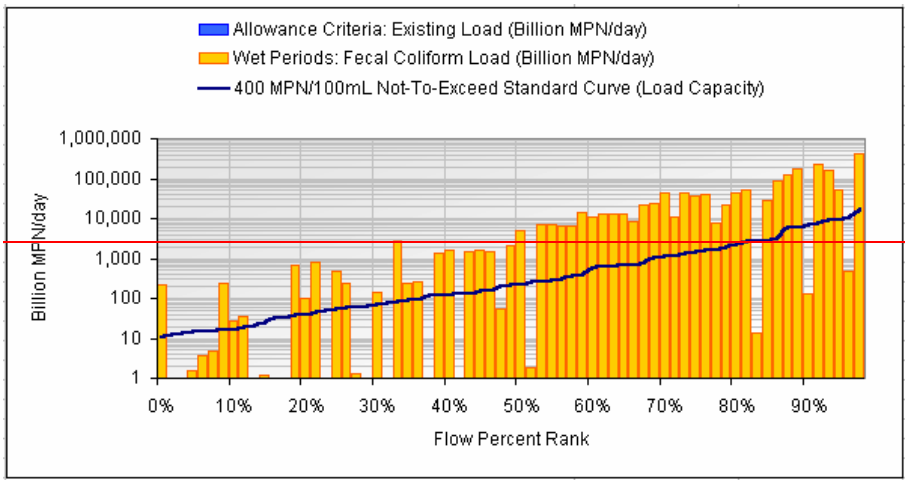
Table I-4. Interim WLAs and LAs for Fecal Coliform in the Aliso Creek Watershed

Watershed	Measure/Unit	Allowable Load	Sum of WLA (municipal MS4)	WLA Caltrans	Sum of LA (Controllable)	Sum of LA (Non-Controllable)	Percent Reduction
Aliso Creek	Load (Billion MPN/Yr)	1,579,074	585,753	241	23,844	968,920	9.9%

The methodology used to generate the info in Table I-4 was used to generate Tables 9-1 through 9-6 in the Technical Report.

II.Calculation of Allowable Loads Using Final Numeric Targets

The methodology for calculating allowable loads and allocations using final numeric targets is similar to the methodology for calculating allowable loads using interim numeric targets. The difference is that with final numeric targets, no exceptions are made for loads due to natural sources. In other words, loads caused by natural sources (represented by the blue-colored bars in Figure I-1) take up the entire loading capacity of the creek. Figure I-3 shows the load-duration curve for fecal coliform for the Aliso Creek watershed, using the final numeric targets.



Fecal Coliform Loading Summary	Value	Units
Total Load for Existing Condition (Total Load)	1,732,709	Billion MPN/Year
Non-allowable Exceedance Load (Exceedance Load)	1,648,711	Billion MPN/Year
Allowable Load = (Total Load - Exceedance Load)	83,999	Billion MPN/Year
Percent Reduction Required from Existing Condition	**95.2%**	**Percentage**

Figure I-3. Subwatershed 202 (Aliso Creek)

Inspection of Figures I-1 and I-3 reveal that the only difference in the graphs is that there are no allowable exceedance loads identified by the blue bars in Figure I-3. In contrast to the discussion in Part I of this appendix, now all the loads in Figure I-1 with magnitudes above the numeric target line, whether or not they are caused by natural sources, are

considered exceedance loads and must be reduced. The allowable load is now only the sum of the bars below the numeric target line.

1.Quantify Current Bacteria Loads and Allowable Loads
As with interim numeric targets, the loads from the entire watershed are derived from loads calculated from each subwatershed. In this case, the loads for Aliso Creek are derived from the load-duration curves representing subwatersheds 201 and 202.

Total Load = $(\text{Total Load})_{\text{Subwatershed 201}}$ + $(\text{Total Load})_{\text{Subwatershed 202}}$
= 19,386 billion MPN/year + 1,732,709 billion MPN/year
= 1,752,095 billion MPN/year

Allowable Load = $(\text{Allowable Load})_{\text{Subwatershed 201}}$ + $(\text{Allowable Load})_{\text{Subwatershed 202}}$
= 563 billion MPN/year + 83,999 billion MPN/year
= 84,562 billion MPN/year

2.Calculate Percent Reduction Required Per Watershed
Percent reduction required for the Aliso Creek watershed is:

$$\text{Percent Reduction} = \frac{(1{,}752{,}095 \text{ billion MPN/mL} - 84{,}562 \text{ billion MPN/mL})}{1{,}752{,}095 \text{ billion MPN/mL}}$$

Percent Reduction = 0.952
= 95%

The required reduction for fecal coliform in the Aliso Creek watershed in order to meet the final numeric targets is 95 percent.

3.Compare Uncontrollable Nonpoint Source Allocations to Allowable Loads
The loads associated with uncontrollable nonpoint sources cannot be reduced because they come from natural sources in the watershed. Comparing the final wet weather allowable loads to the loads allocated to uncontrollable nonpoint sources (from the previous analysis) shows that, in every watershed, the uncontrollable nonpoint source allocation is greater than the TMDL. This indicates that the natural bacteria sources in the watersheds consume and exceed the assimilative capacity of the creeks, resulting in allocations of zero loads to all remaining sources, namely controllable point and nonpoint sources.

The allocations for the Aliso Creek watershed are shown below in Table I-5. The allocations for the remaining watersheds are shown in Tables I-12 through I-14.

Table I-5. Final WLAs and LAs for Fecal Coliform in the Aliso Creek Watershed

Watershed	Measure/Unit	Allowable Load	Sum of WLA (Municipal MS4)	Sum of WLA Caltrans	Sum of LA (Controllable)	Sum of LA (Non-controllable)	Percent Reduction
Aliso Creek	Load (Billion MPN/Yr)	84,562	0	0	0	968,920	95%

III.Calculation of Allowable Loads Using Interim and Final Numeric Targets for Dry Weather Analysis

Because the density of bacteria in receiving water during dry weather is extremely variable in nature, a separate approach from the wet weather LSPC model was needed. An approach was developed that relied on detailed analysis of available data to better identify and characterize sources.

To represent the linkage between source contributions and in-stream response, a steady-state mass balance model was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady state flow and bacteria load.

Analysis showed that dry weather loading is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters. These types of nuisance flows are referred to as urban runoff.

Because urban runoff is overwhelmingly the main source of bacteria loading during dry weather, the allowable loads calculated from the mass balance model were allocated solely to municipal MS4s. Allocations for nonpoint sources were unnecessary since land uses associated with these sources generally do not generate runoff to receiving water during dry weather conditions. Additionally, dry weather loads from Caltrans highways were assumed to be insignificant because during dry periods there is no significant urban runoff from Caltrans owned roadway surfaces.

An example calculation of dry weather TMDLs and wasteload allocations is shown below using the Aliso Creek watershed as an example. For the Aliso Creek watershed, the existing fecal coliform load estimated by the model was approximately 53,972 billion MPN/year. The percent reduction required and the allocations are shown in Table I-6. The dry weather TMDL for the Aliso Creek watershed is 2,383 MPN/year (see Technical Report, section 8.2, for a discussion of TMDL calculation).

Table I-6. Dry Weather WLAs and LAs for Fecal Coliform in the Aliso Creek Watershed

Watershed	Measure/Unit	Allowable Load	Sum of WLA (Municipal MS4)	Sum of WLA Caltrans	Sum of LA (Controllable)	Sum of LA (Non-controllable)	Percent Reduction
Aliso Creek	Load (Billion MPN/Yr)	2,383	2,383	0	0	0	96%

1.Use of Interim and Final Numeric Targets

Unlike the wet weather model, the dry weather model does not use the reference system approach. This is because available data show that exceedances of WQOs in local reference systems during dry weather conditions are uncommon (see Technical Report, section 4.2). Further, reference systems do not generate significant dry weather bacteria loads because flows are minimal. During dry weather, flow, and hence bacteria loads, are largely generated by urban runoff, which is not a product of a reference system. Therefore interim numeric targets for dry weather to incorporate a reference system are unnecessary.

Interim and final numeric targets were utilized in a different capacity from the wet weather analysis. Interim and final numeric targets were utilized for total coliform, for protection of REC-1 and SHELL beneficial uses, respectively. Interim allowable loads were calculated using the REC-1 WQOs as numeric targets. Final allowable loads for total coliform were calculated using numeric targets equal to the more stringent SHELL WQOs.

For the Aliso Creek watershed, the existing total coliform load estimated by the model was approximately 262,841 billion MPN/year. Tables I-7 and I-8 show the use of interim and final numeric targets for total coliform, and the percent reductions needed using interim and final numeric targets.

*Table I-7. Dry Weather **Interim** WLAs and LAs for Total Coliform in the Aliso Creek Watershed*

Watershed	Measure/Unit	Allowable Load	Sum of WLA (municipal MS4)	WLA Caltrans	Sum of LA (Controllable)	Sum of LA (Non-Controllable)	Percent Reduction
Aliso Creek	Load (Billion MPN/Yr)	11,915	11,915	0	0	0	90.6%

*Table I-8. Dry Weather **Final** WLAs and LAs for Total Coliform in the Aliso Creek Watershed*

Watershed	Measure/Unit	Allowable Load	Sum of WLA (Municipal MS4)	Sum of WLA Caltrans	Sum of LA (Controllable)	Sum of LA (Non-controllable)	Percent Reduction
Aliso Creek	Load (Billion MPN/Yr)	834	834	0	0	0	99.7%

The information in Tables I-7 and I-8 was used to generate Tables 9-1 through 9-6 of the Technical Report.

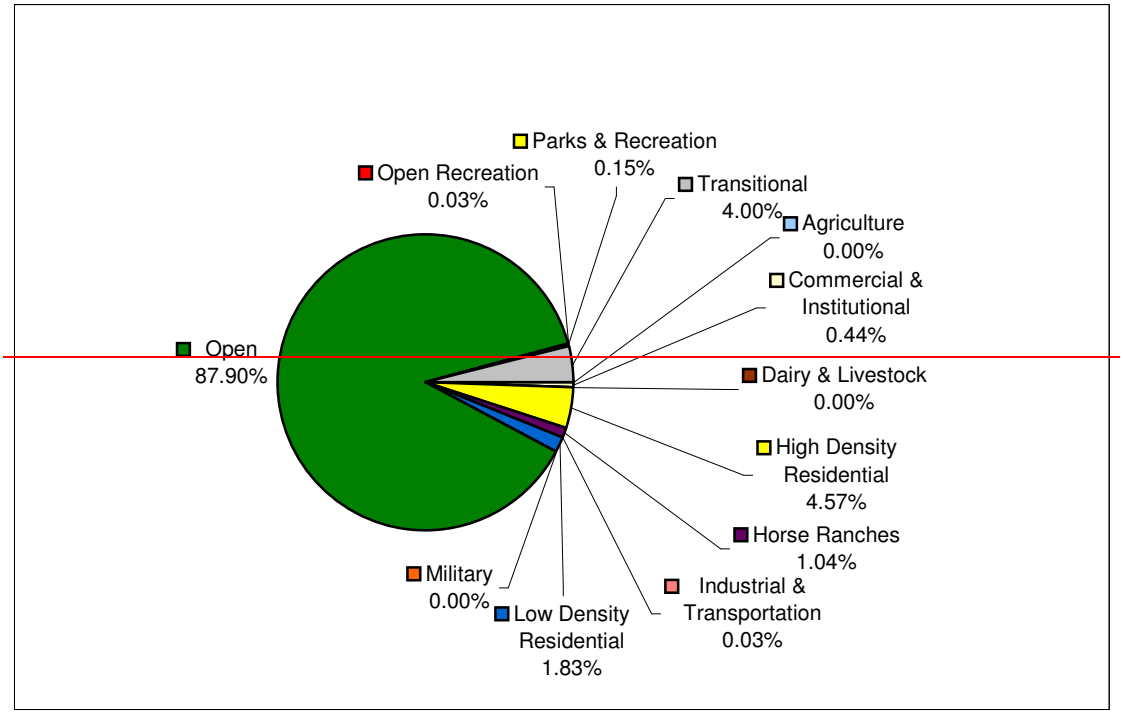


Figure I-4. Load Distribution of Fecal Coliform by Land Use in the San Joaquin Hills/Laguna Beach Watershed

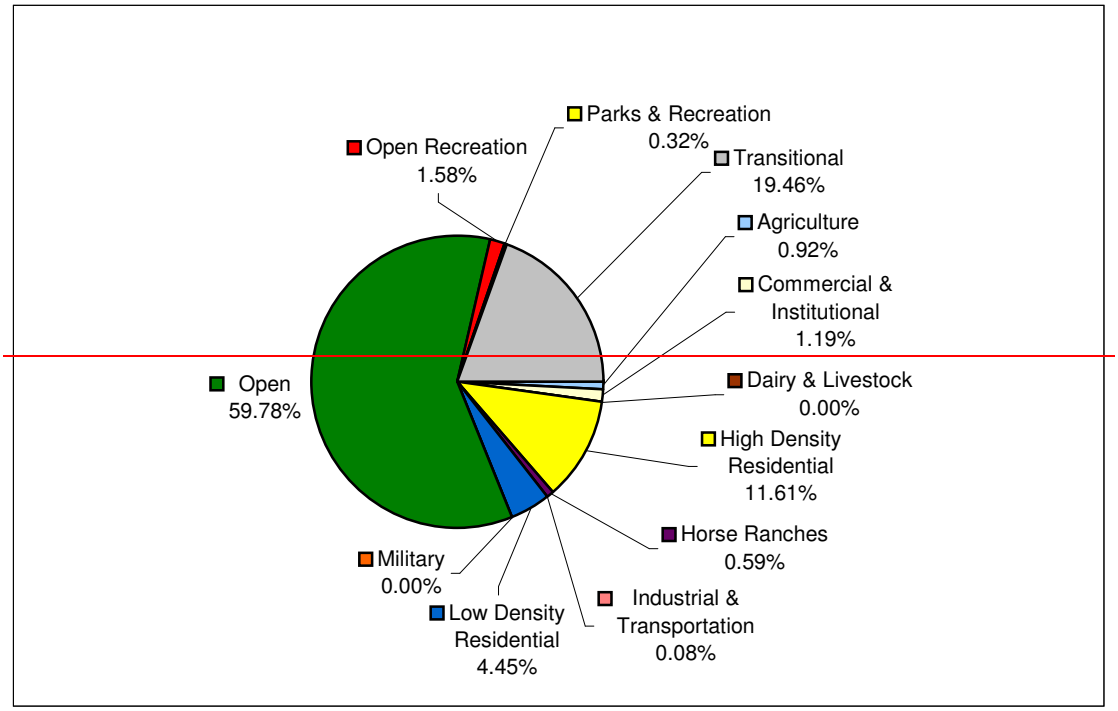


Figure I-5. Load Distribution of Fecal Coliform by Land Use in the Aliso Watershed

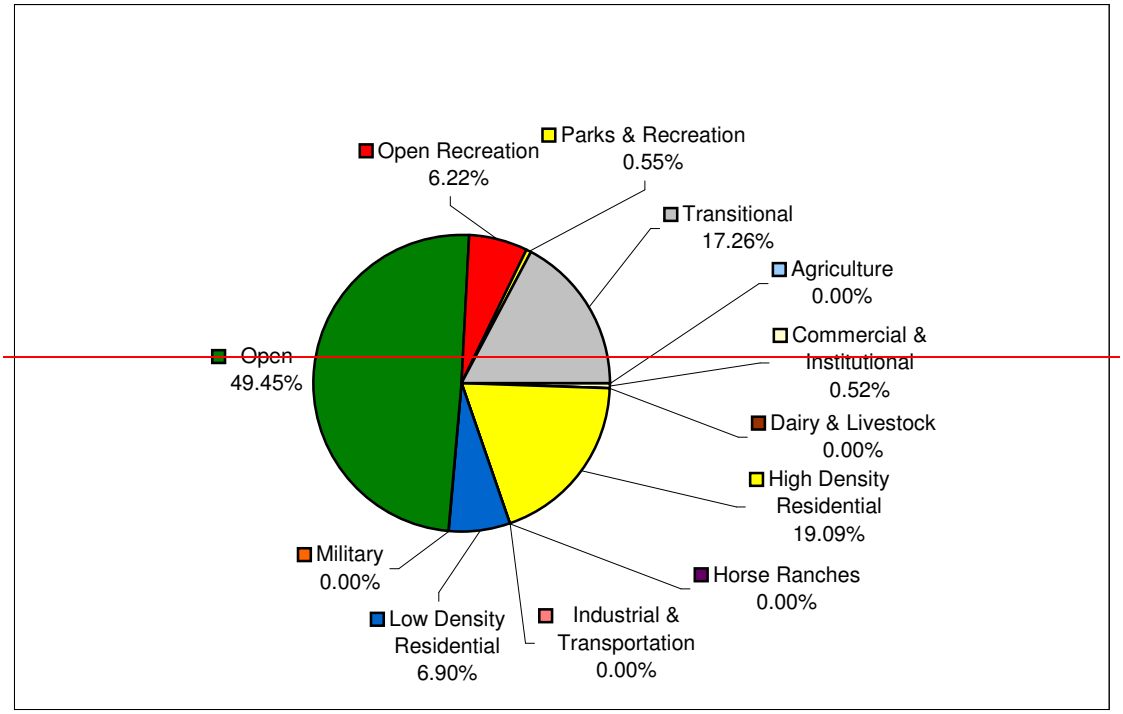


Figure I-6. Load Distribution of Fecal Coliform by Land Use in the Dana Point Watershed

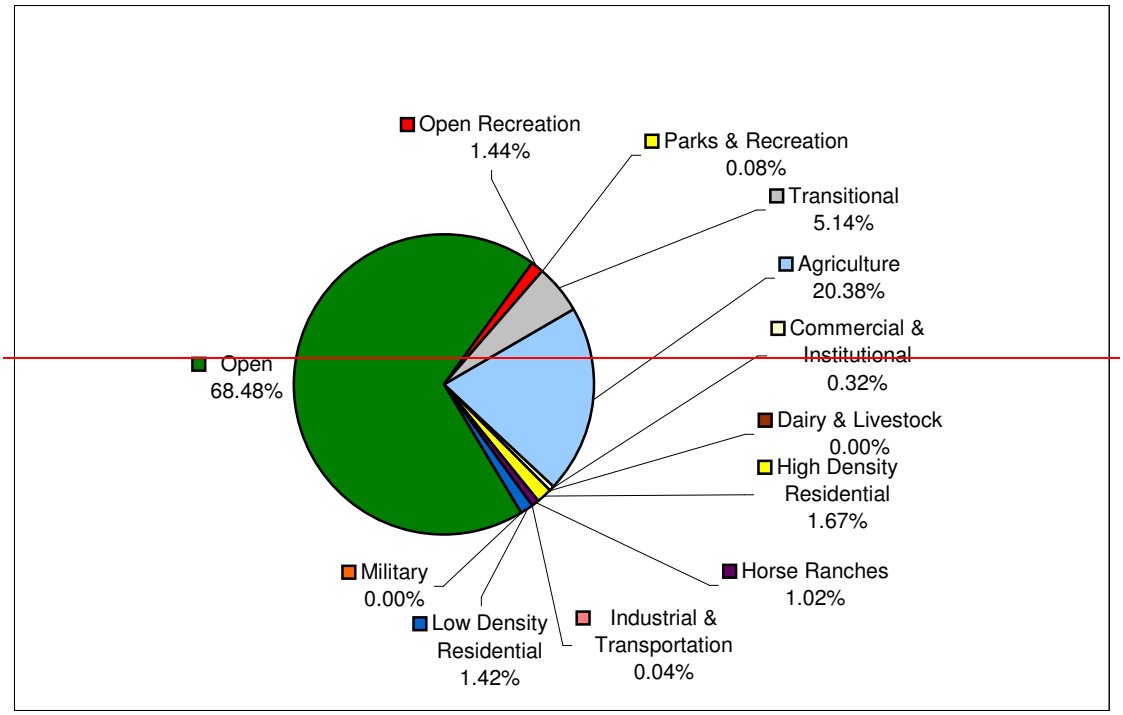


Figure I-7. Load Distribution of Fecal Coliform by Land Use in the Lower San Juan Watershed

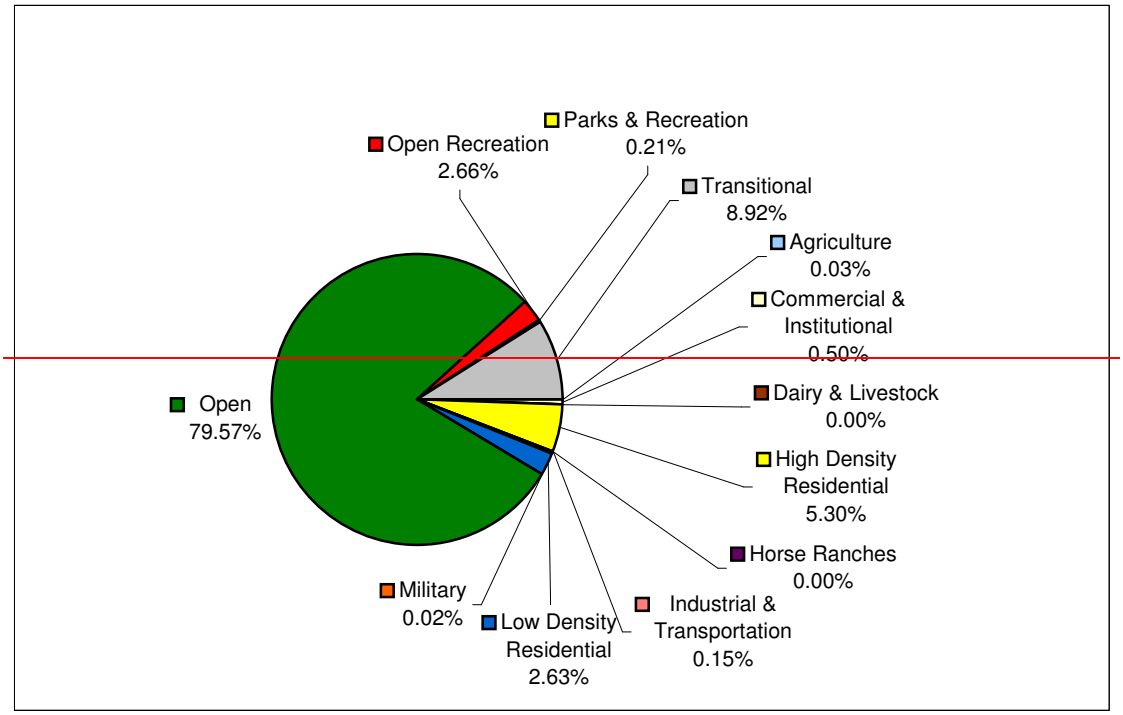


Figure I-8. Load Distribution of Fecal Coliform by Land Use in the San Clemente Watershed

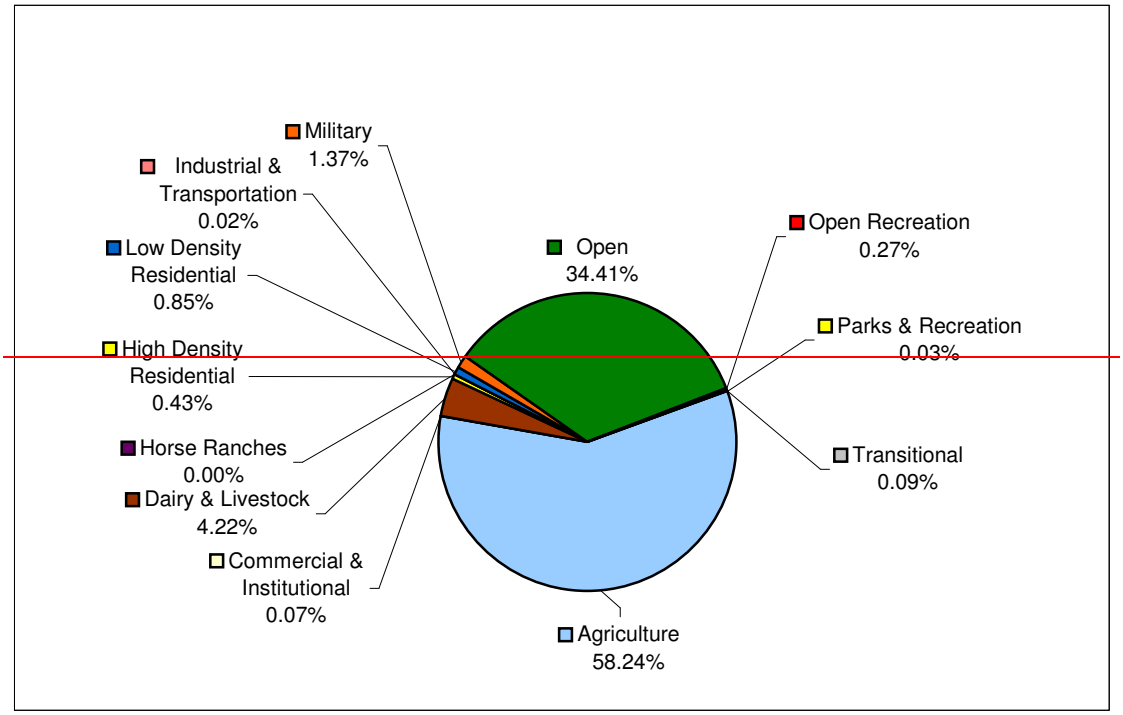


Figure I-9. Load Distribution of Fecal Coliform by Land Use in the San Luis Rey Watershed

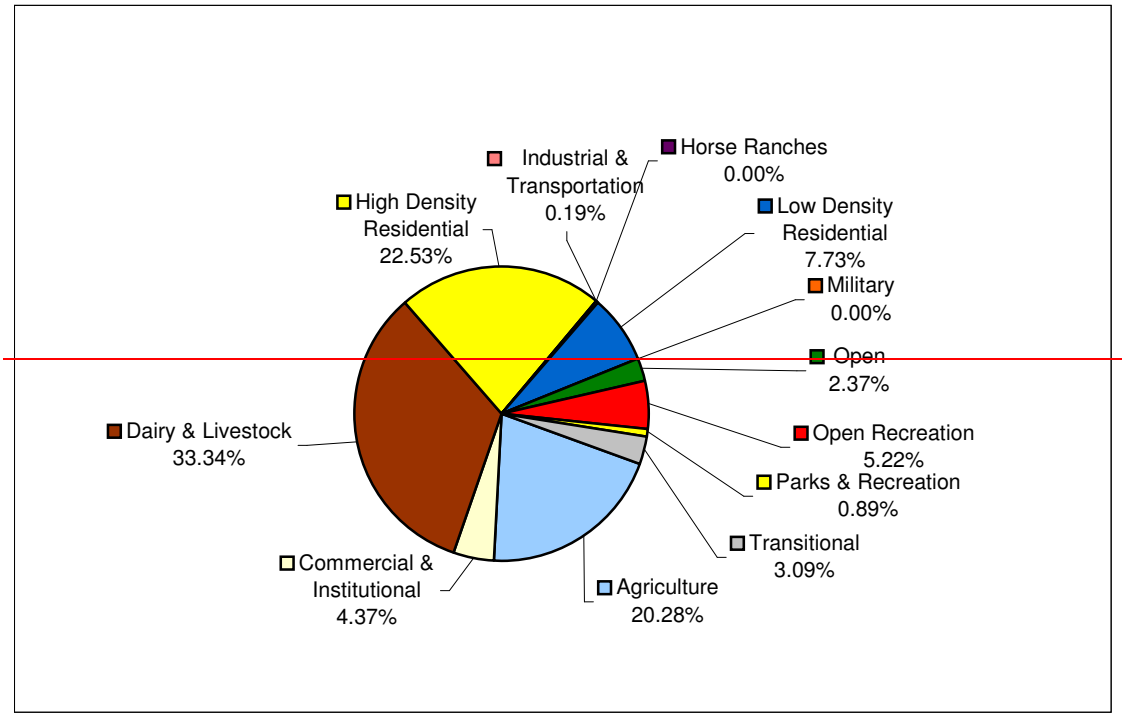


Figure I-10. Load Distribution of Fecal Coliform by Land Use in the San Marcos Watershed

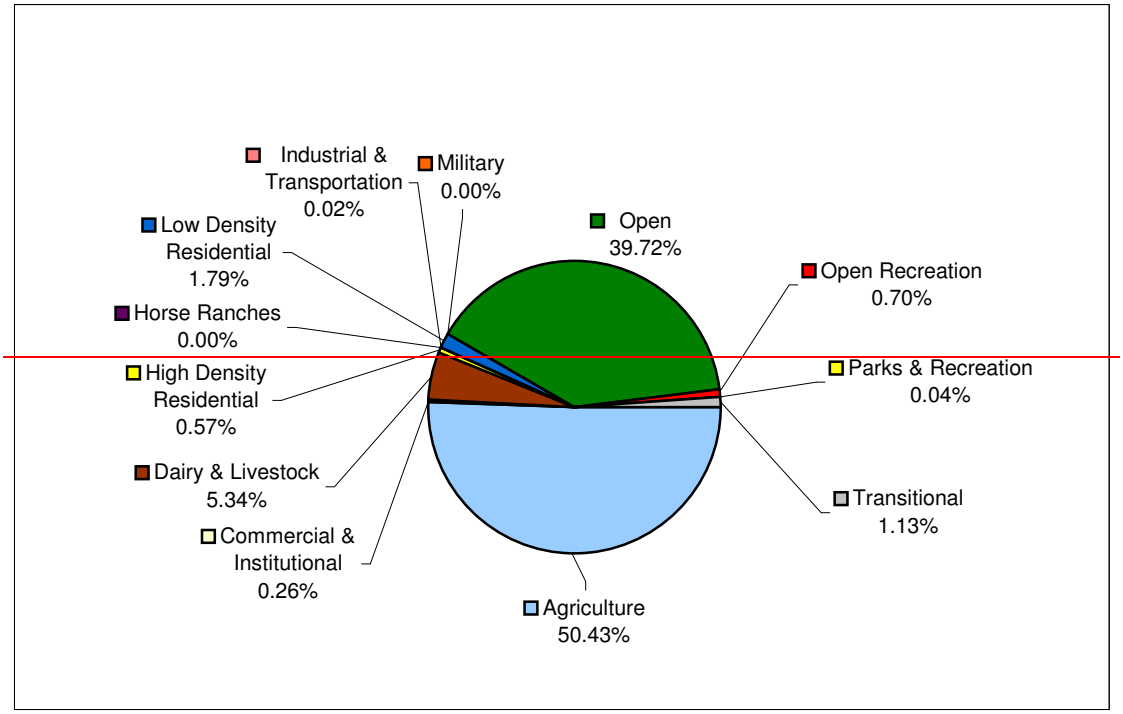


Figure I-11. Load Distribution of Fecal Coliform by Land Use in the San Dieguito Watershed

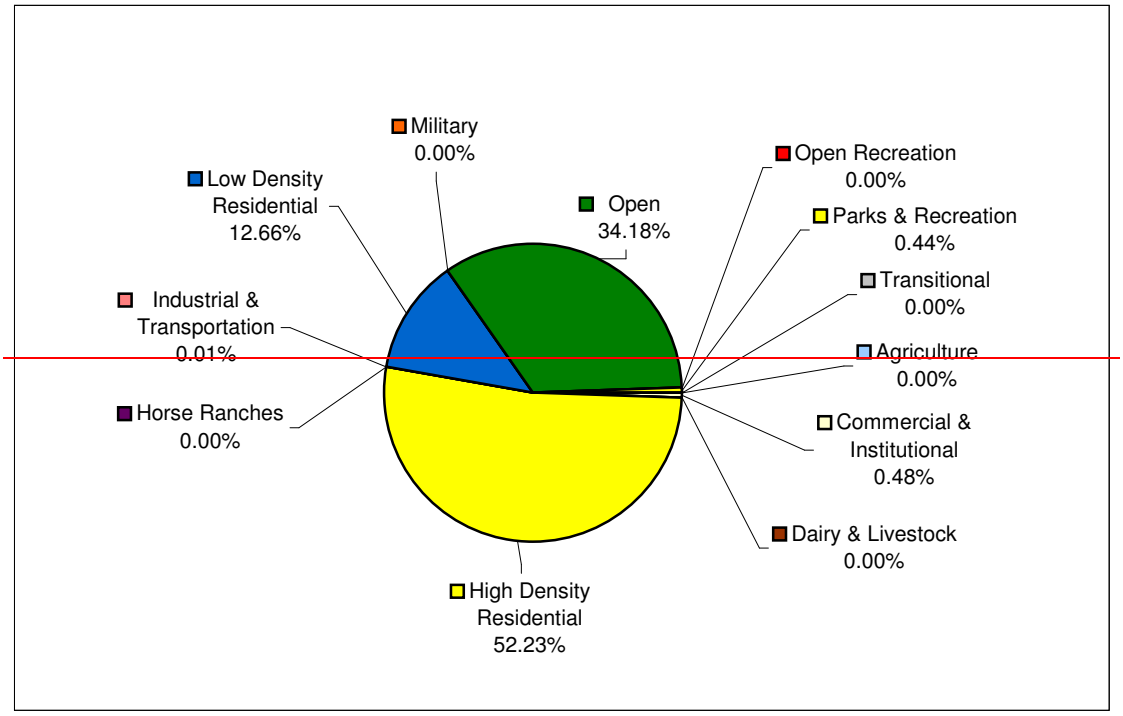


Figure I-12. Load Distribution of Fecal Coliform by Land Use in the Miramar Watershed

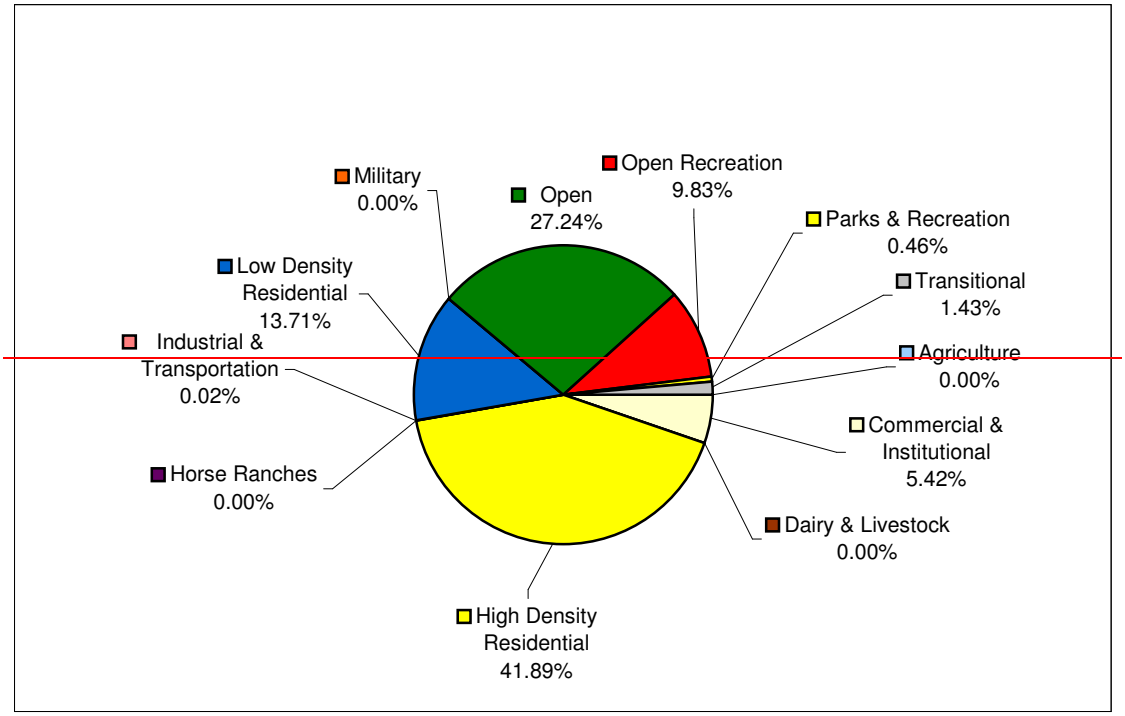


Figure I-13. Load Distribution of Fecal Coliform by Land Use in the Scripps Watershed

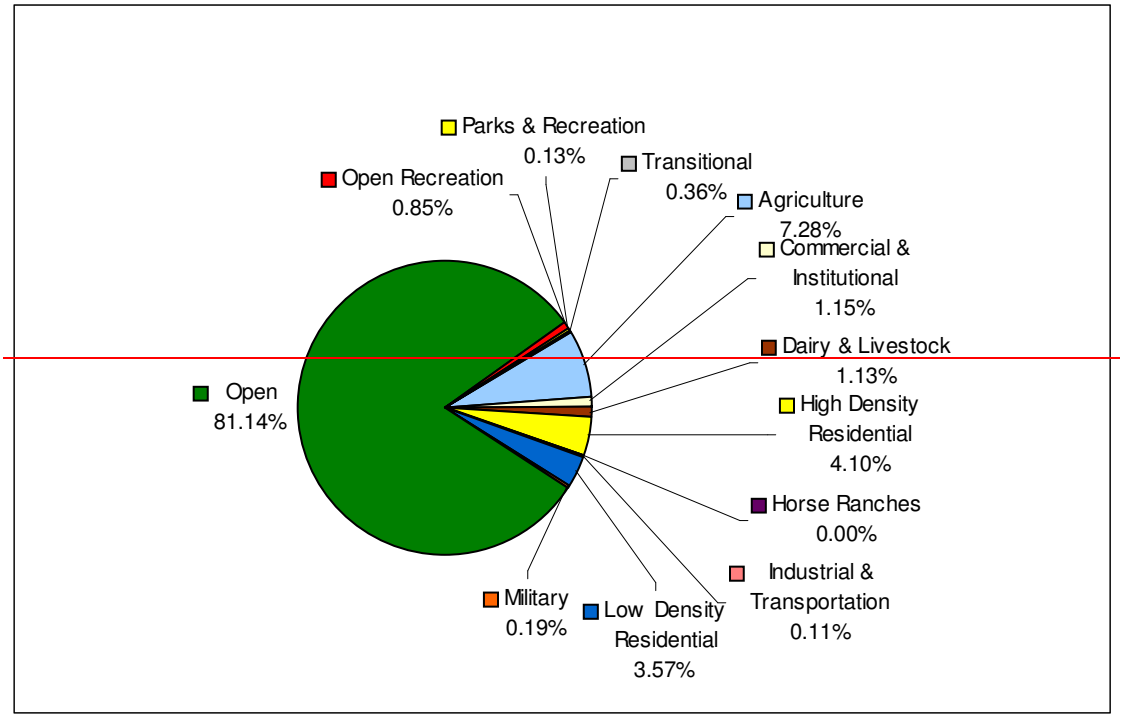


Figure I-14. Load Distribution of Fecal Coliform by Land Use in the San Diego River Watershed

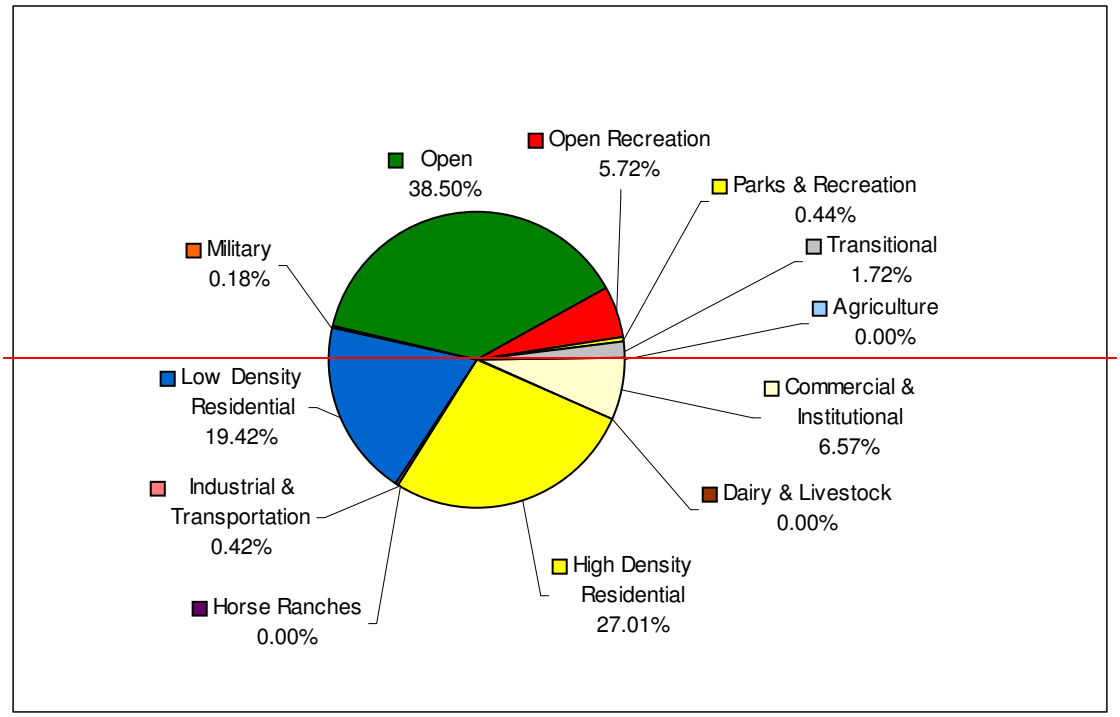


Figure I-15. Load Distribution of Fecal Coliform by Land Use in the Chollas Watershed

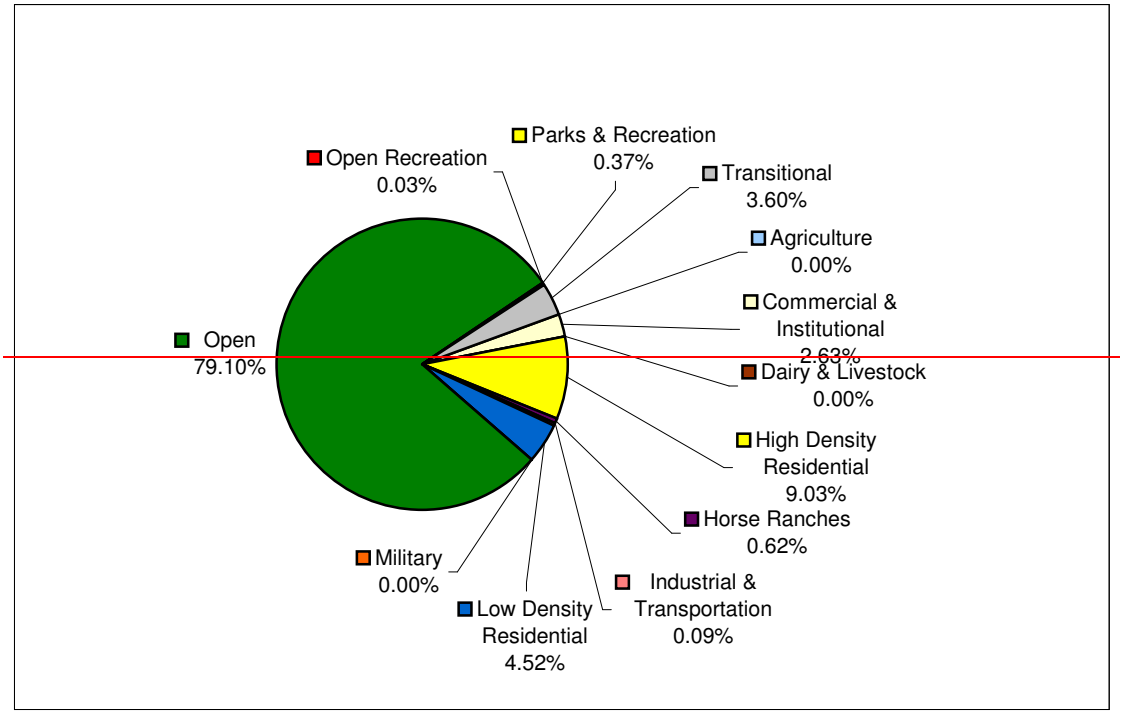


Figure I-16. Load Distribution of Total Coliform by Land Use in the San Joaquin Hills/Laguna Beach Watershed

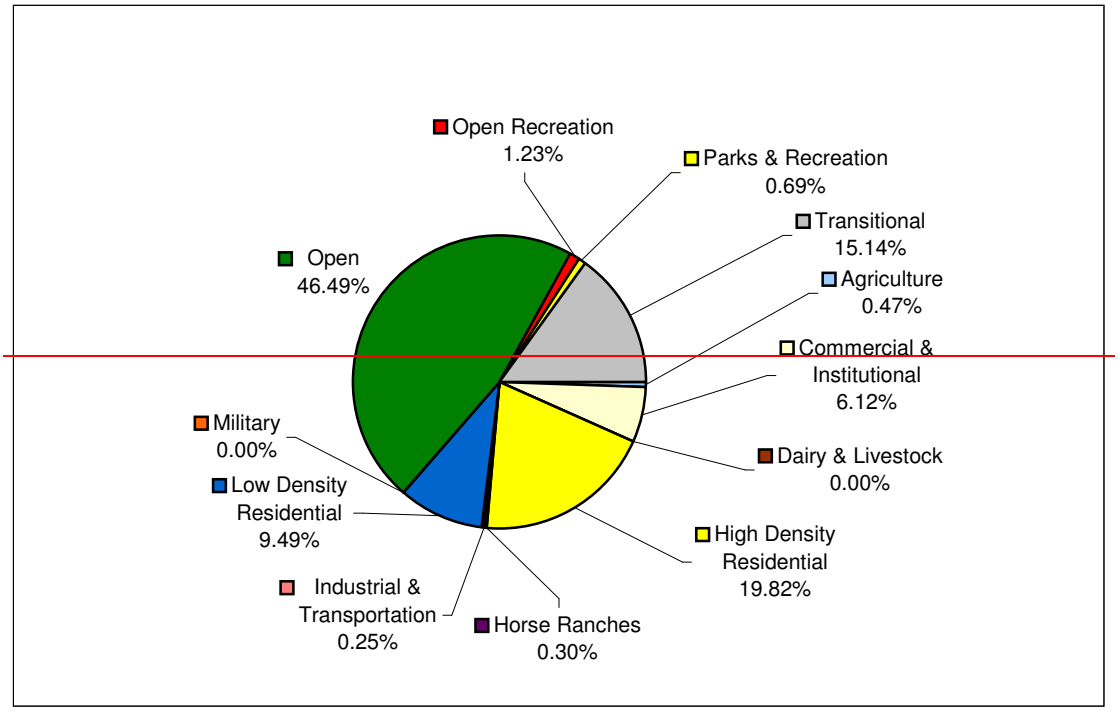


Figure I-17. Load Distribution of Total Coliform by Land Use in the Aliso Watershed

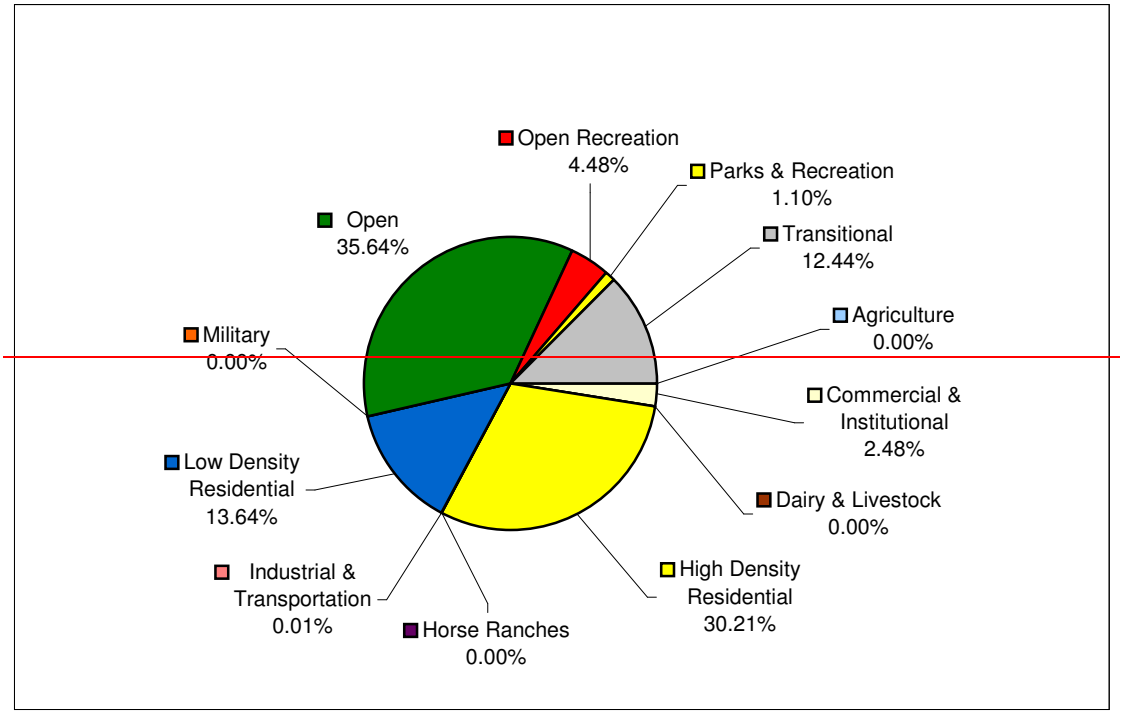


Figure I-18. Load Distribution of Total Coliform by Land Use in the Dana Point Watershed

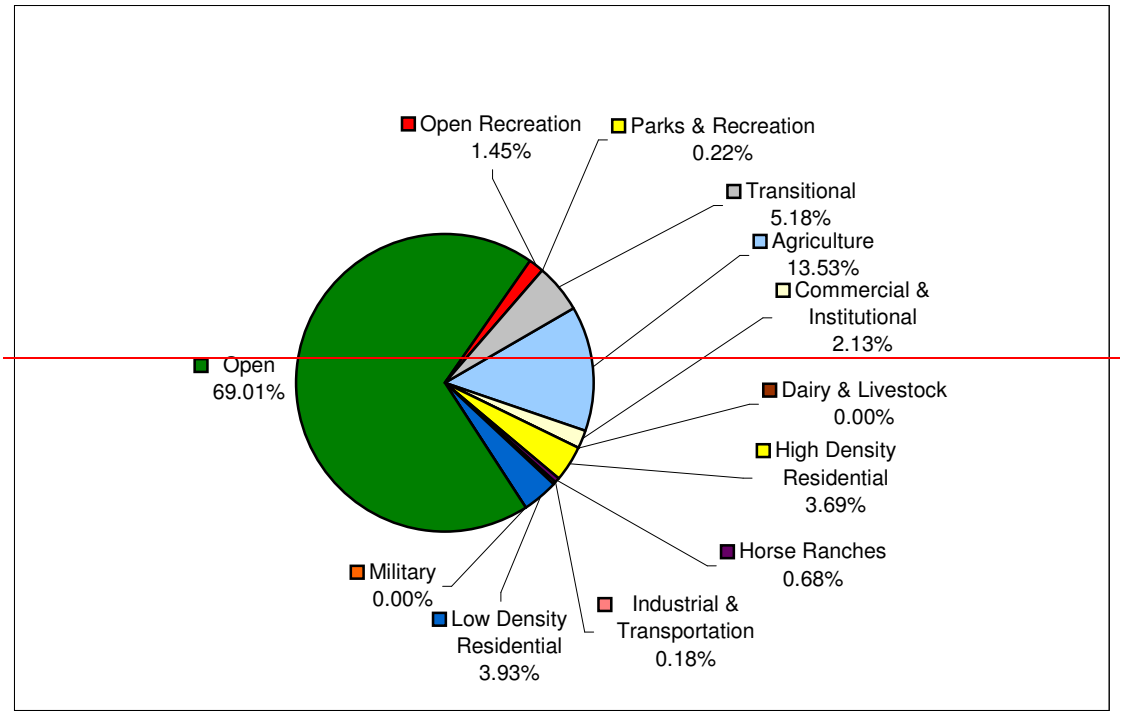


Figure I-19. Load Distribution of Total Coliform by Land Use in the Lower San Juan Watershed

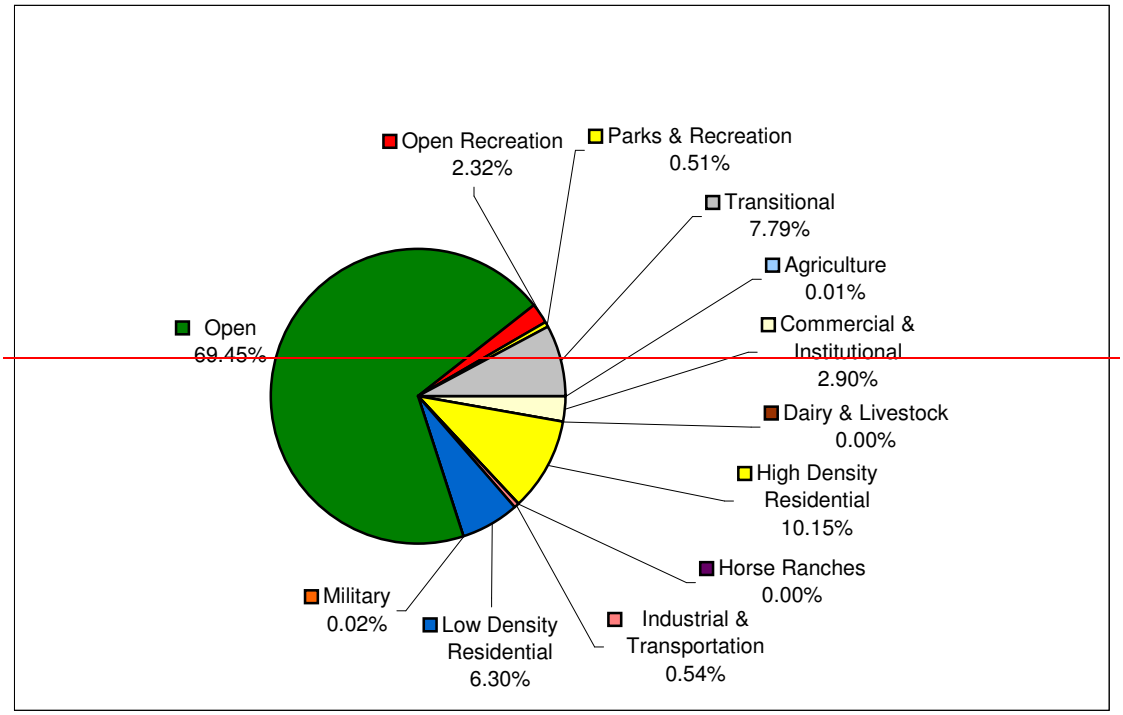


Figure I-20. Load Distribution of Total Coliform by Land Use in the San Clemente Watershed

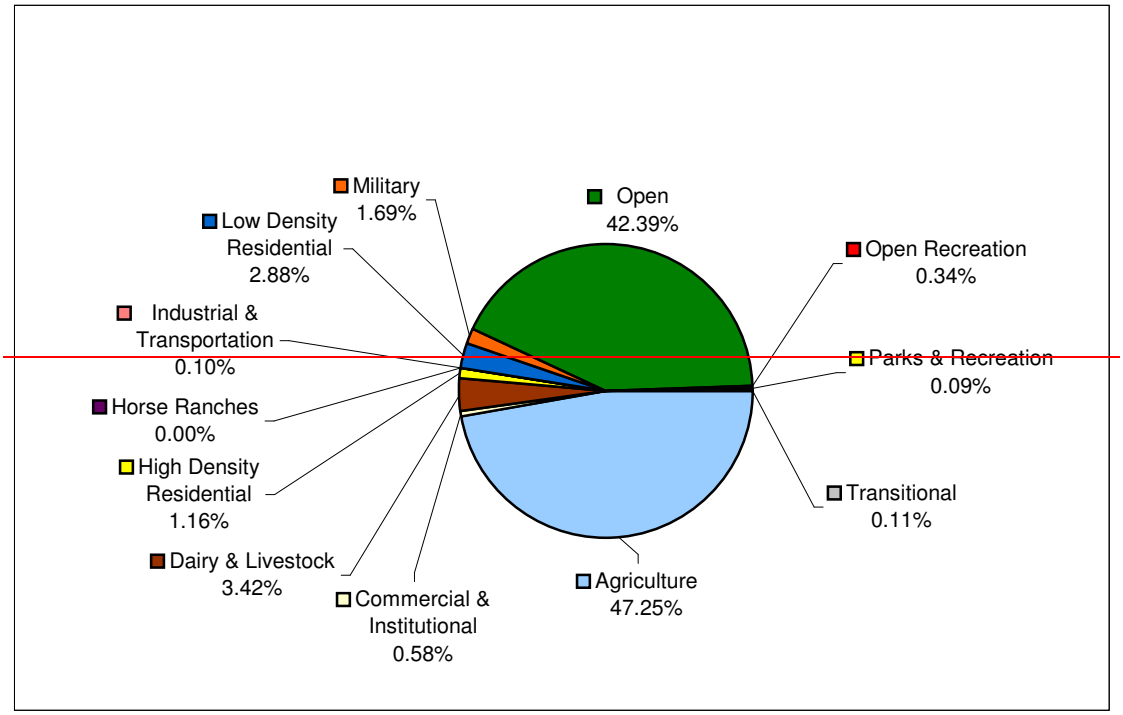


Figure I-21. Load Distribution of Total Coliform by Land Use in the San Luis Rey Watershed

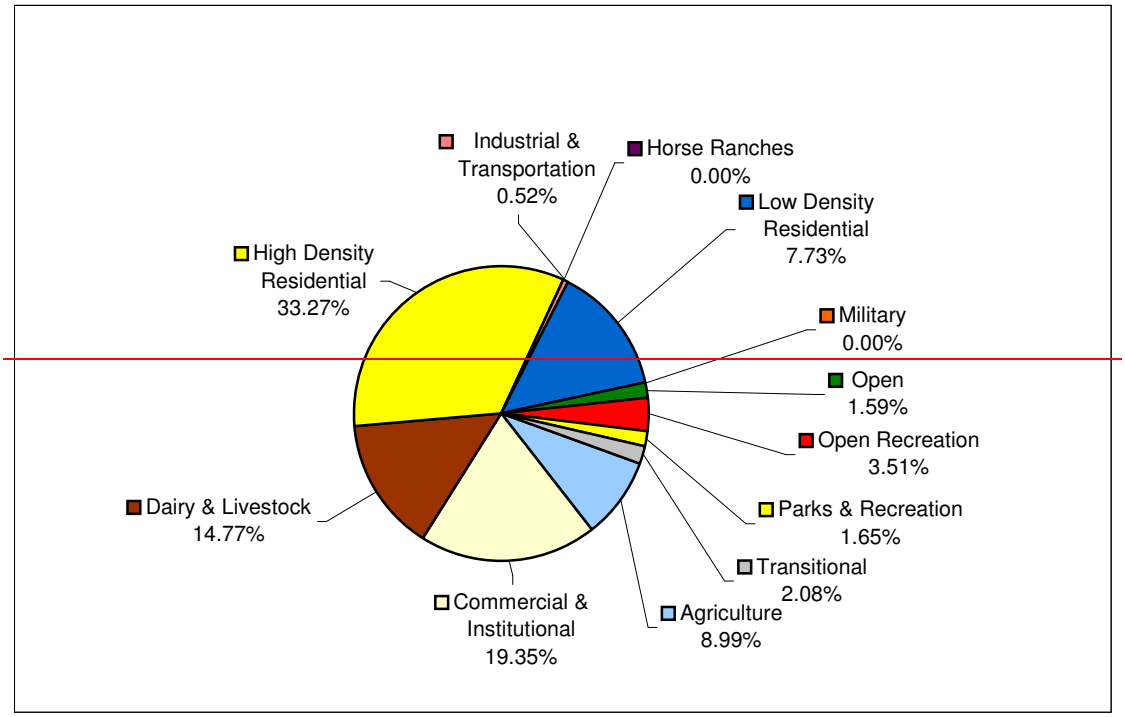


Figure I-22. Load Distribution of Total Coliform by Land Use in the San Marcos Watershed

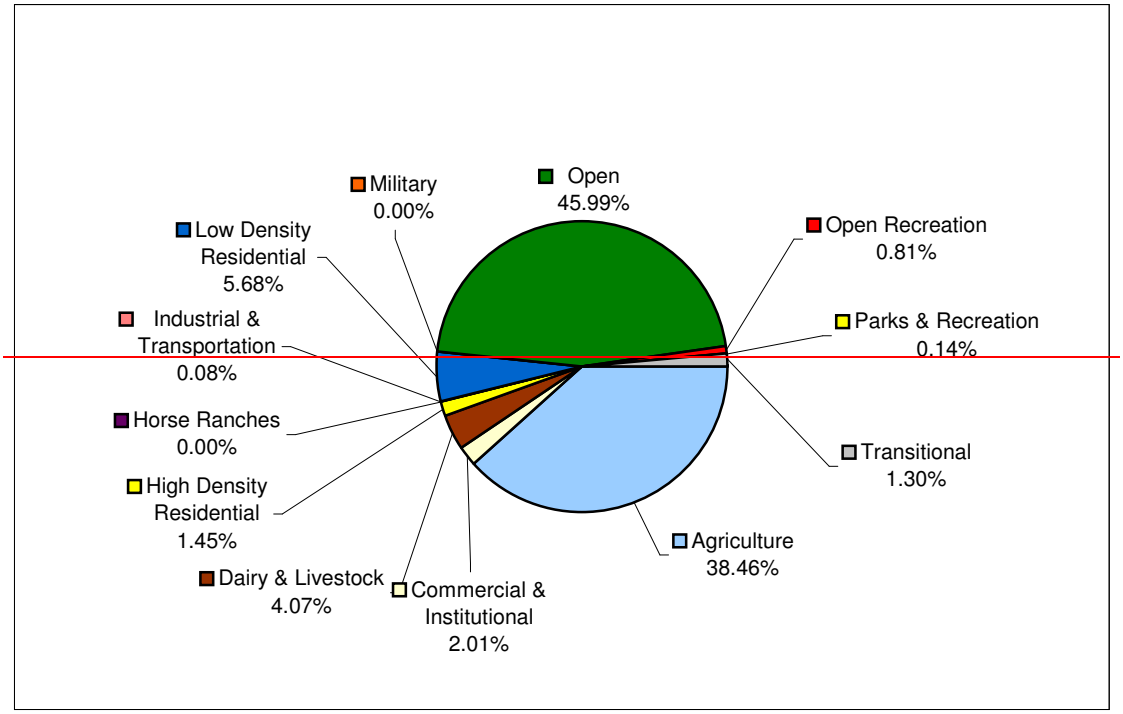


Figure I-23. Load Distribution of Total Coliform by Land Use in the San Dieguito Watershed

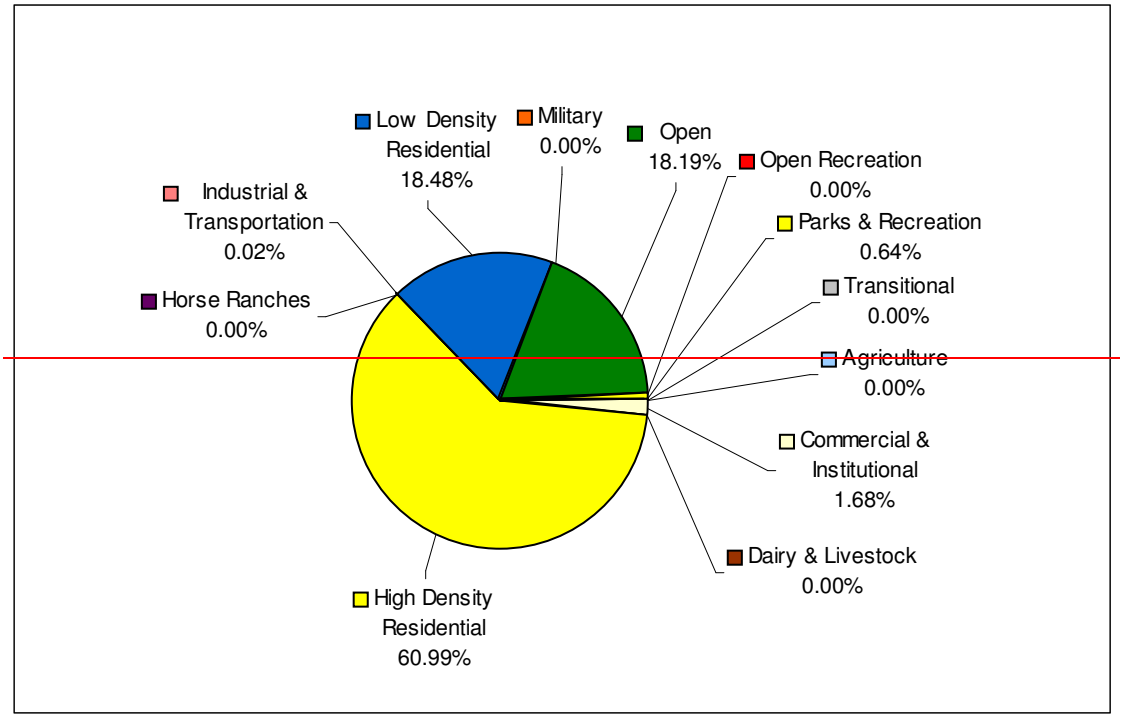


Figure I-24. Load Distribution of Total Coliform by Land Use in the Miramar Watershed

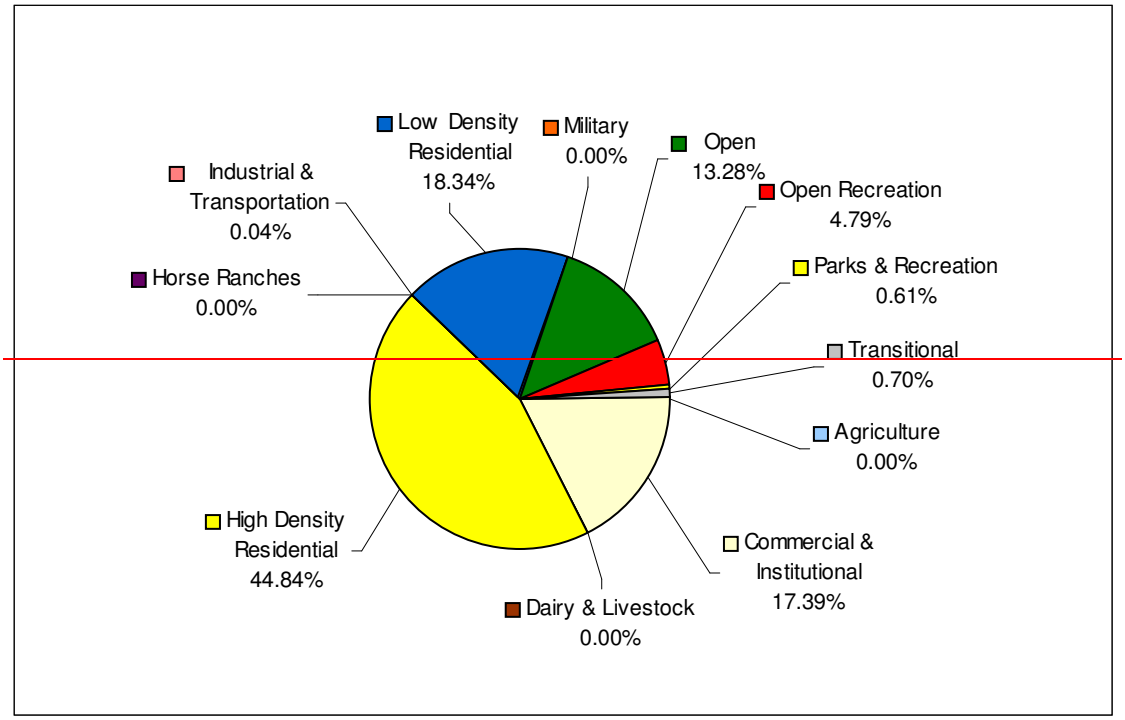


Figure I-25. Load Distribution of Total Coliform by Land Use in the Scripps Watershed

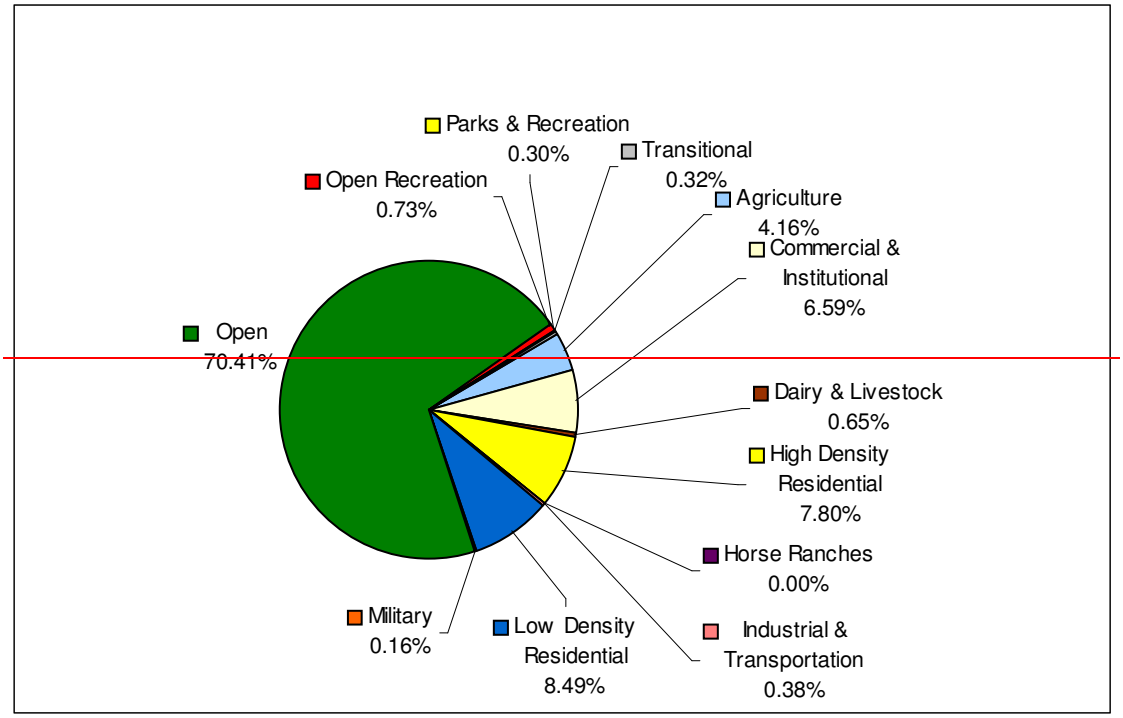


Figure I-26. Load Distribution of Total Coliform by Land Use in the San Diego River Watershed

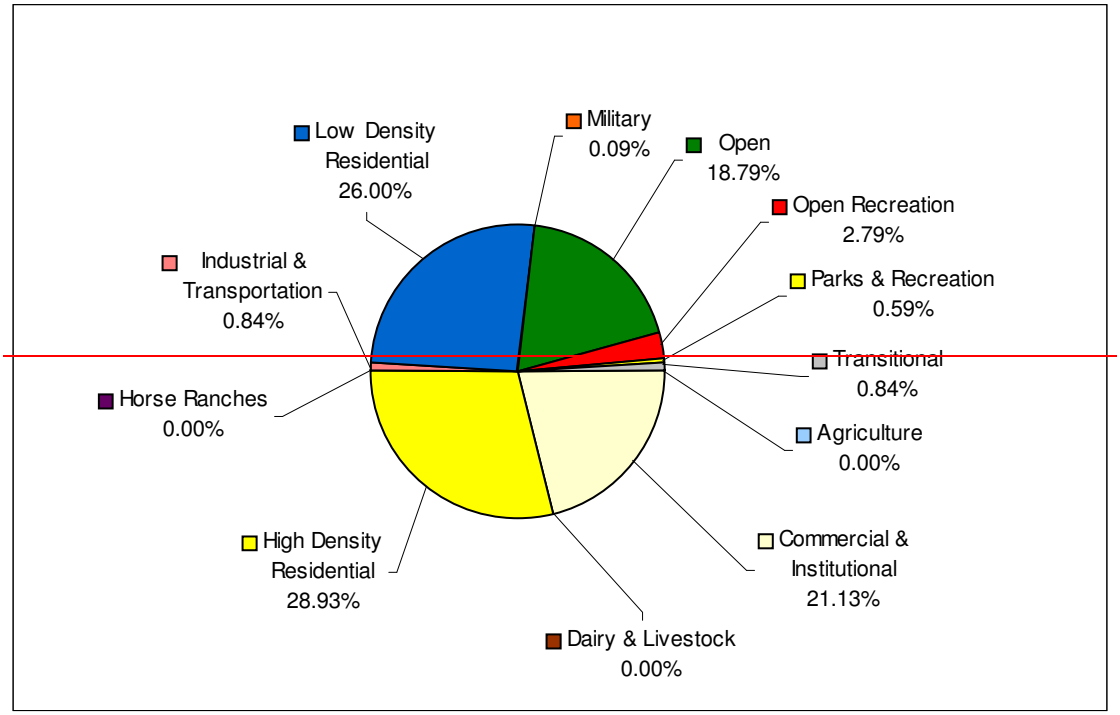
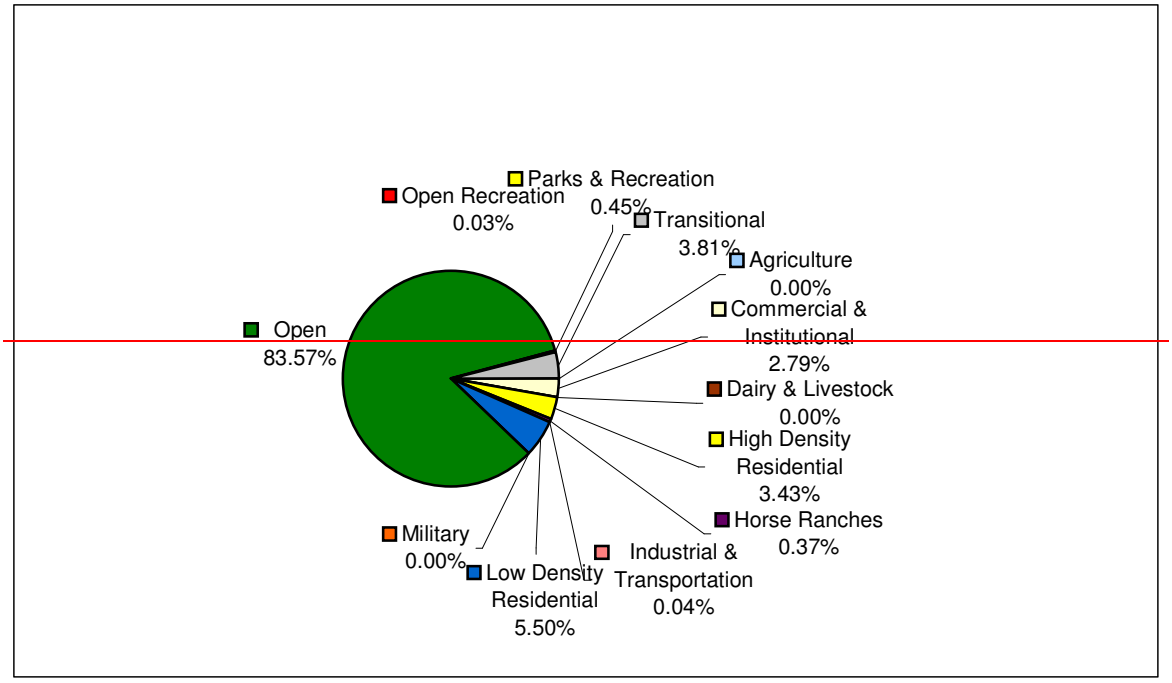
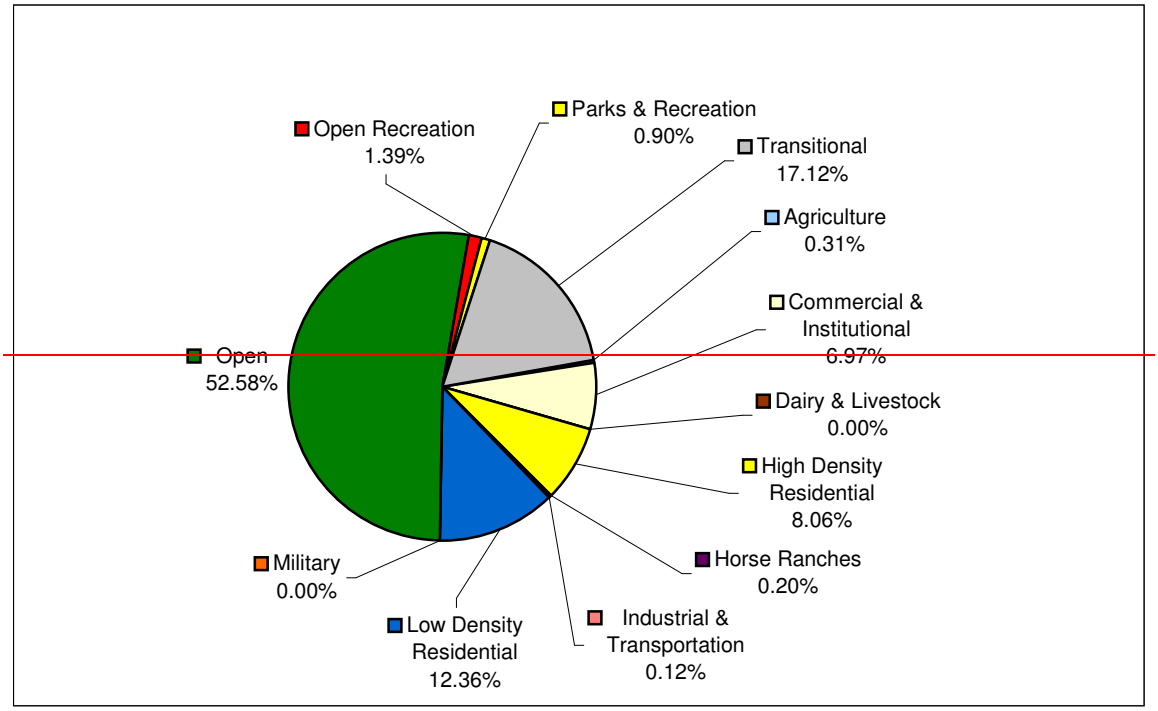


Figure I-27. Load Distribution of Total Coliform by Land Use in the Chollas Watershed



~~Figure I-28. Load Distribution of Enterococci by Land Use in the San Joaquin Hills/Laguna Beach Watershed~~



~~Figure I-29. Load Distribution of Enterococci by Land Use in the Aliso Watershed~~

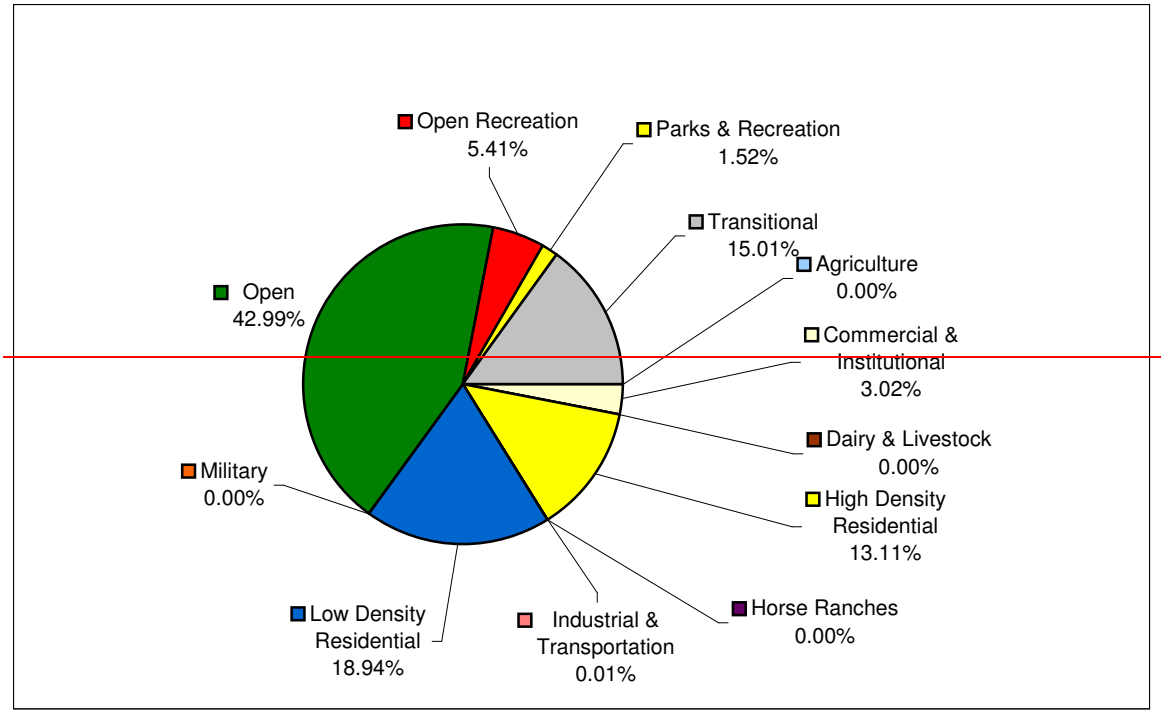


Figure I-30. Load Distribution of Enterococci by Land Use in the Dana Point Watershed

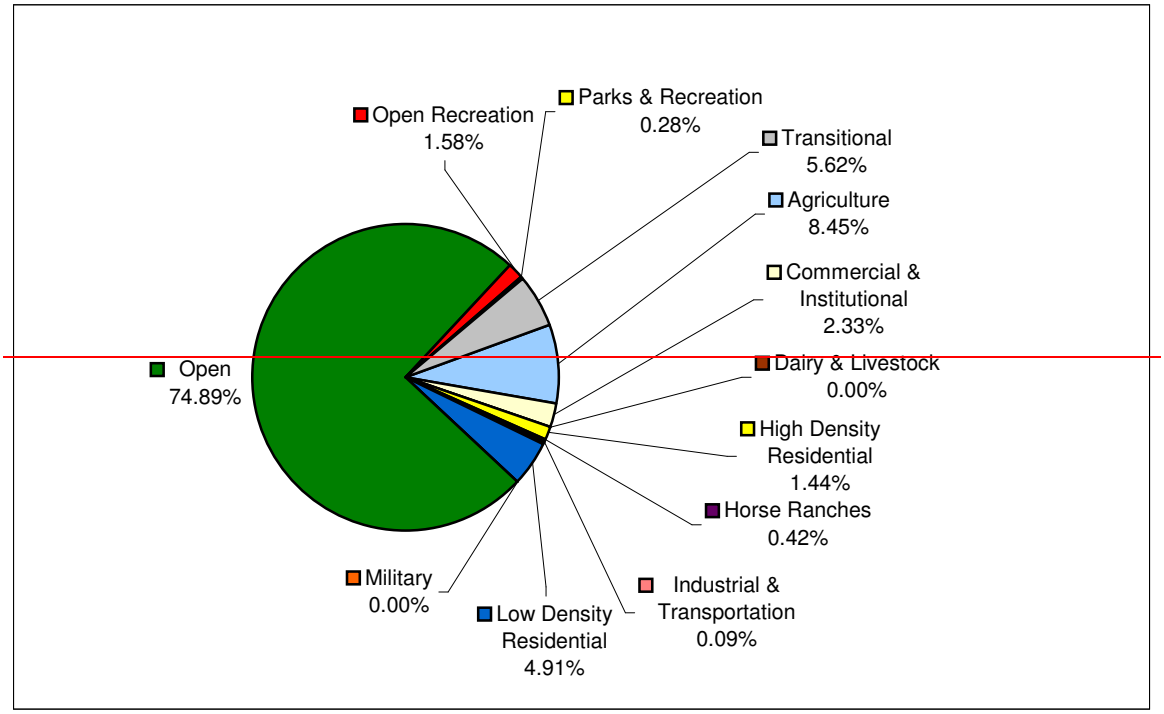


Figure I-31. Load Distribution of Enterococci by Land Use in the Lower San Juan Watershed

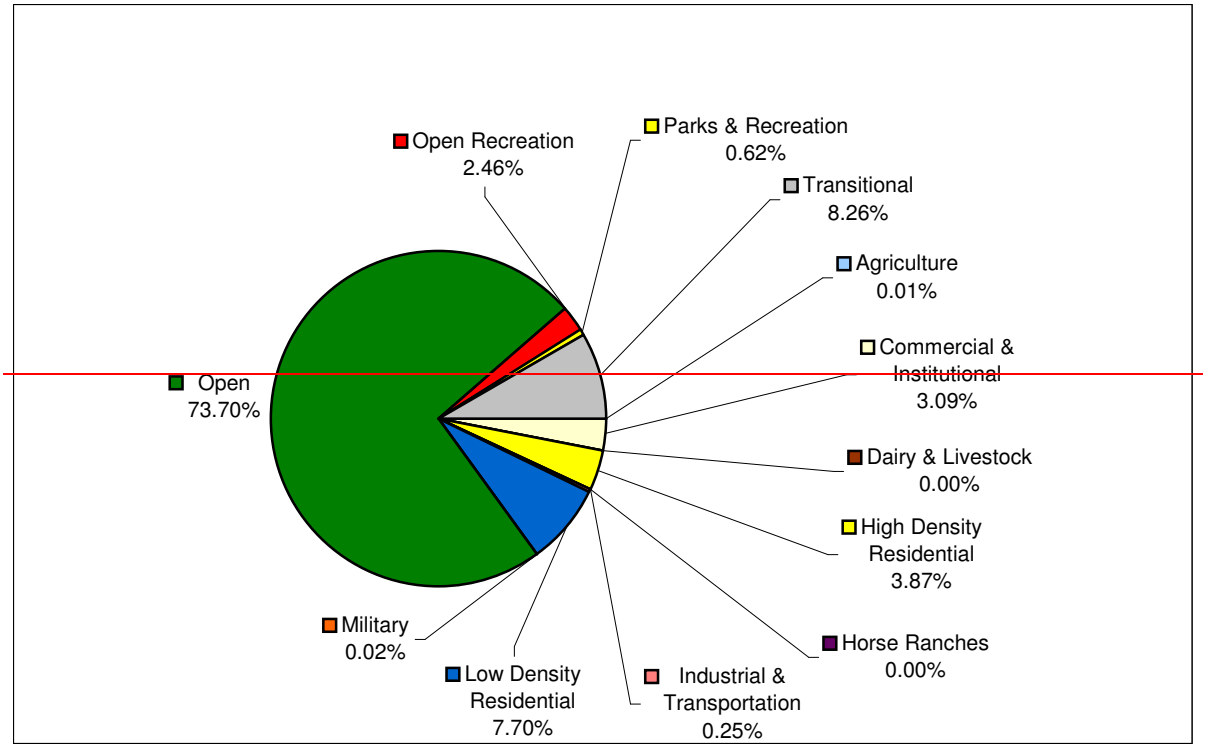


Figure I-32. Load Distribution of Enterococci by Land Use in the San Clemente Watershed

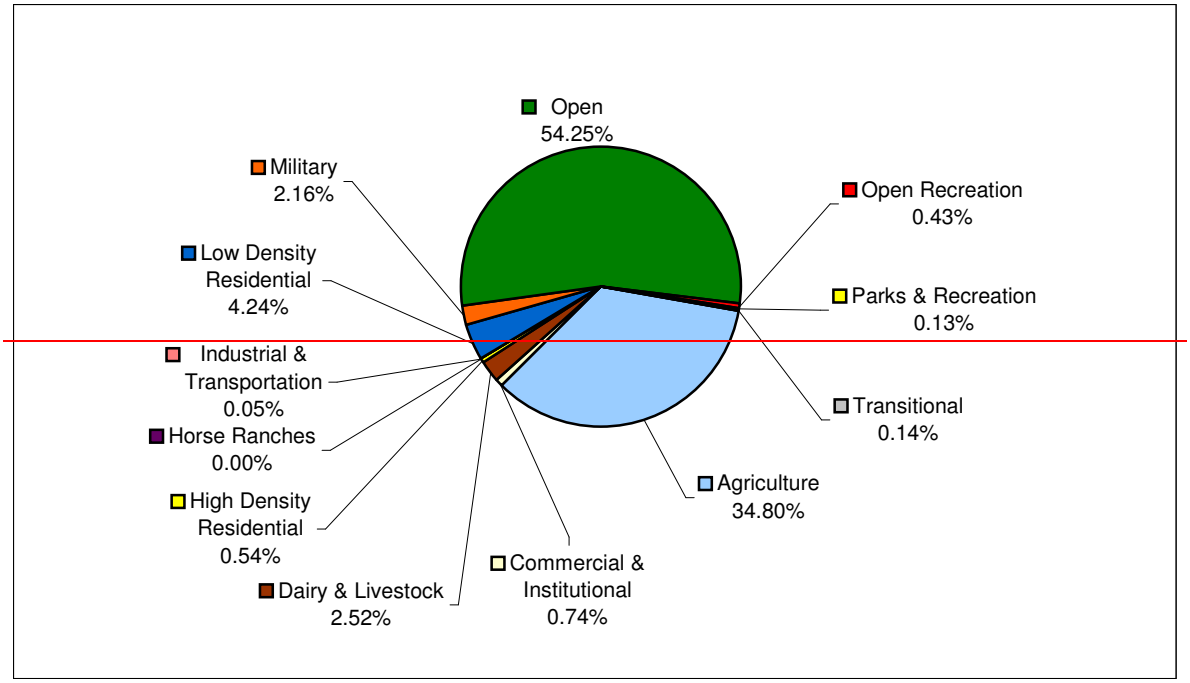


Figure I-33. Load Distribution of Enterococci by Land Use in the San Luis Rey Watershed

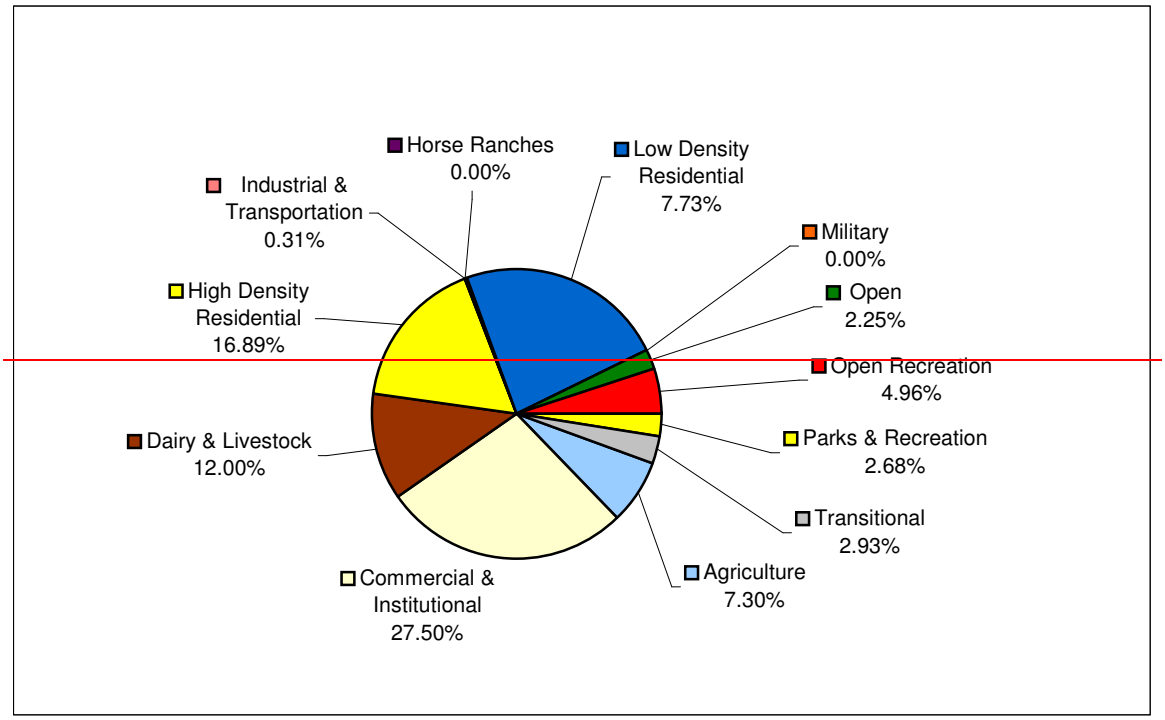


Figure I-34. Load Distribution of Enterococci by Land Use in the San Marcos Watershed

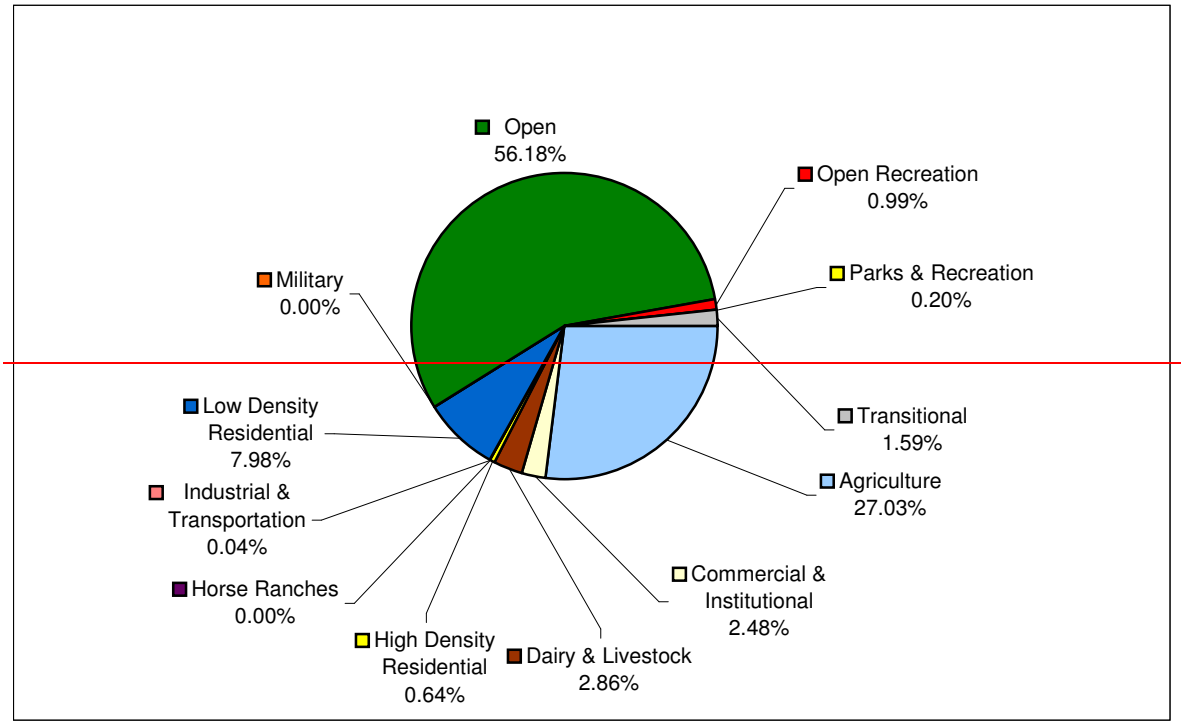


Figure I-35. Load Distribution of Enterococci by Land Use in the San Dieguito Watershed

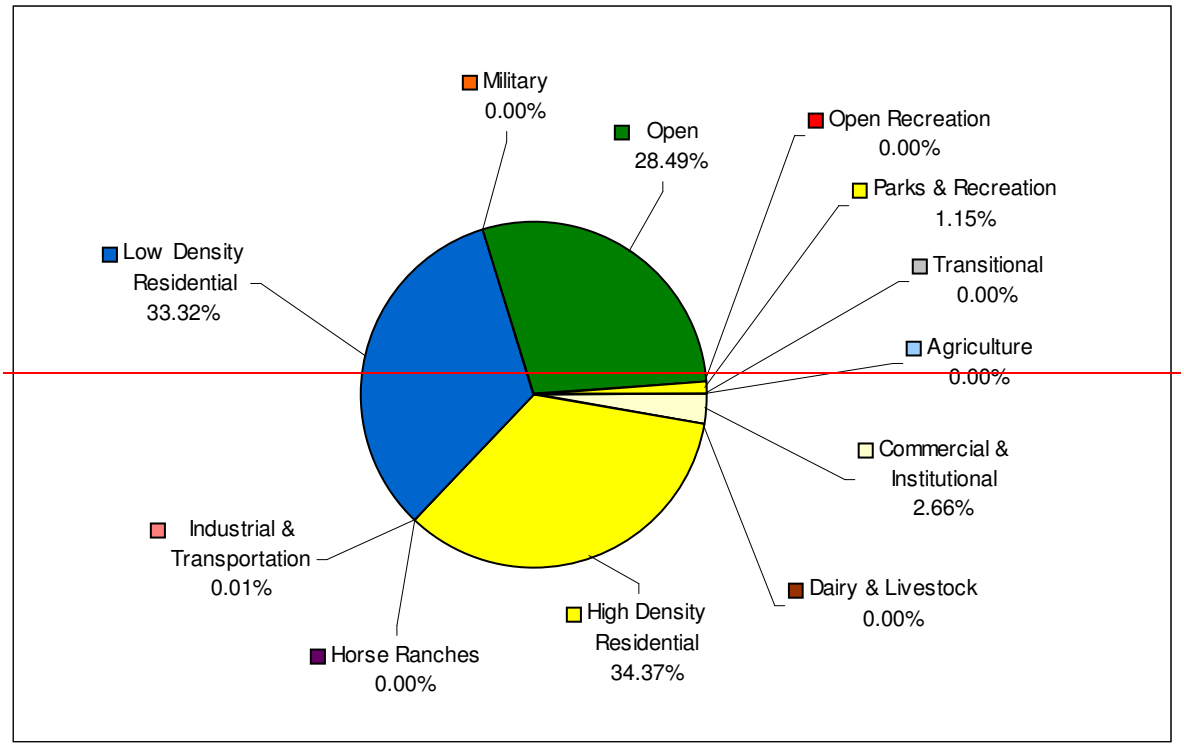


Figure I-36. Load Distribution of Enterococci by Land Use in the Miramar Watershed

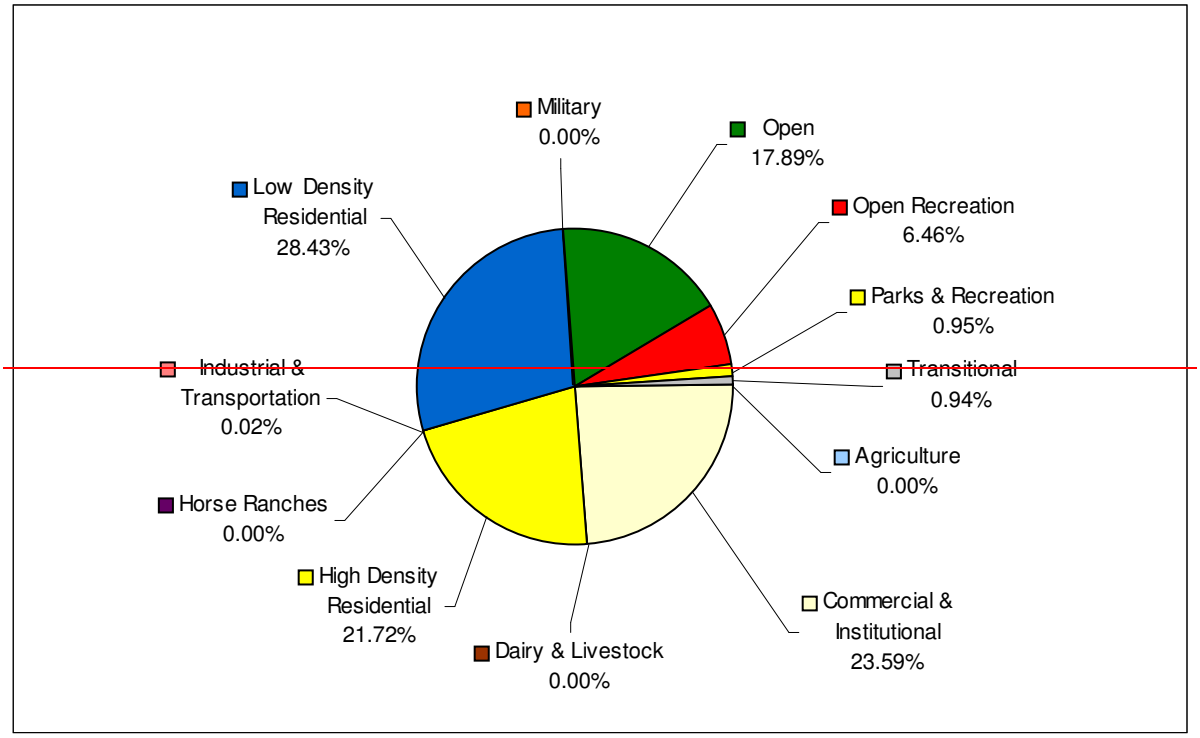


Figure I-37. Load Distribution of Enterococci by Land Use in the Scripps Watershed

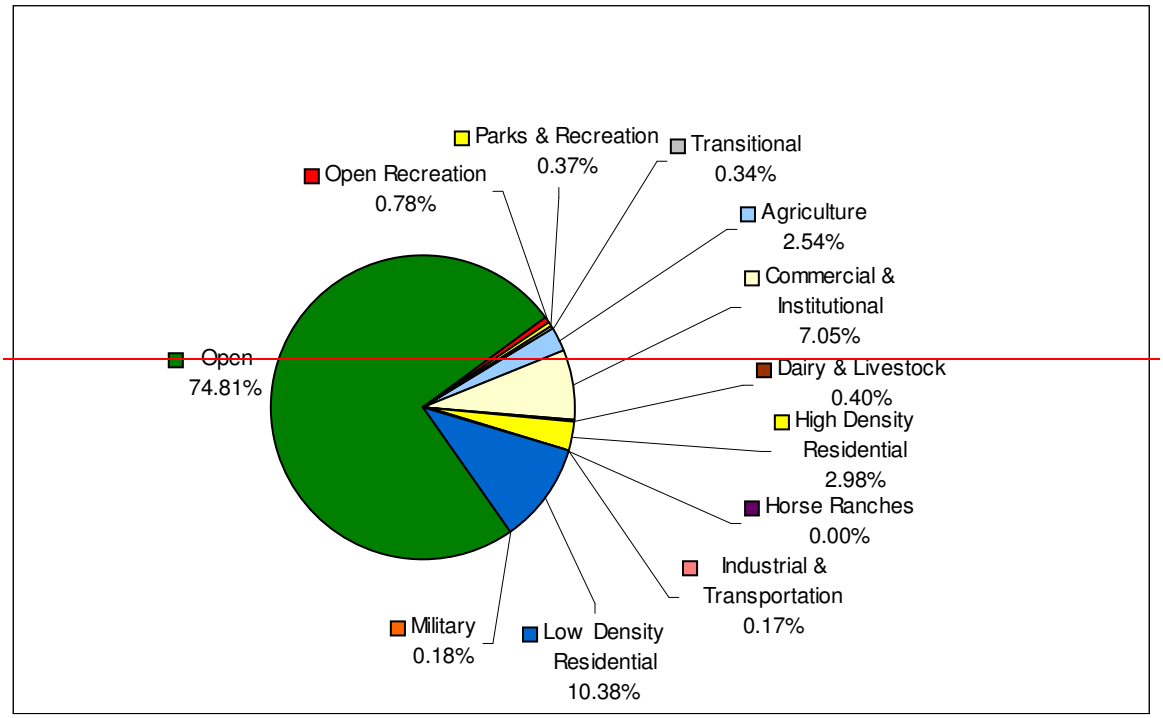


Figure I-38. Load Distribution of Enterococci by Land Use in the San Diego River Watershed

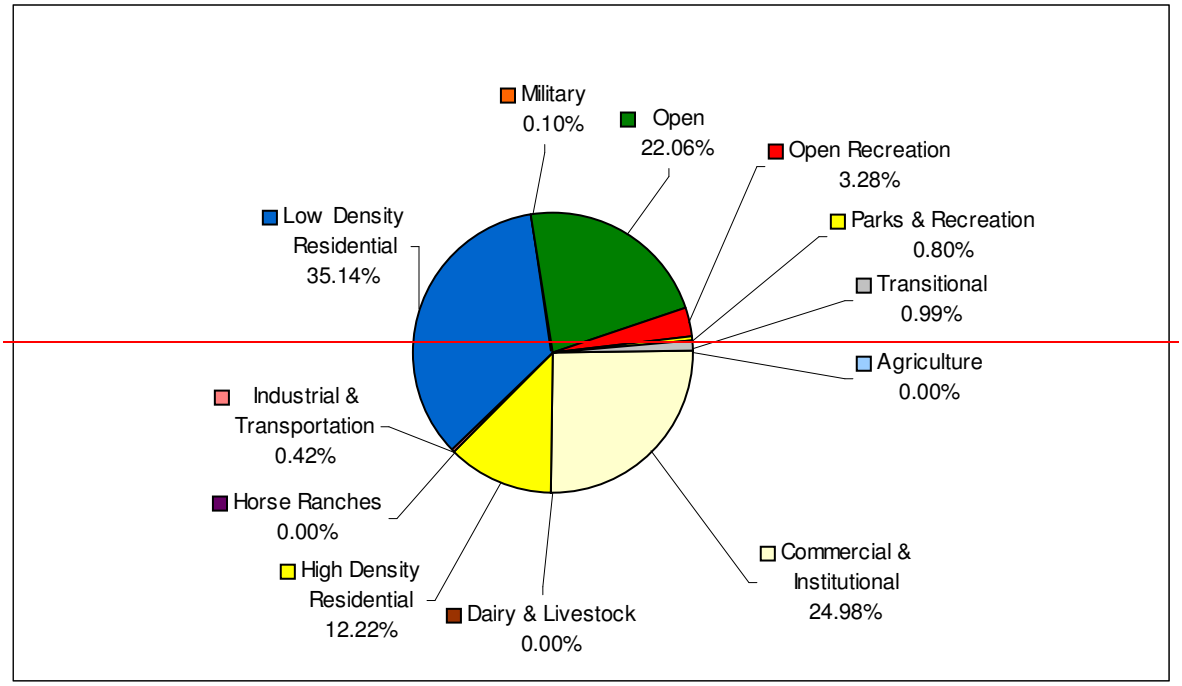


Figure I-39. Load Distribution of Enterococci by Land Use in the Chollas Watershed

Table I-9 Distribution of Allowable Fecal Coliform Loads by Land Use Using Interim Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/ Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Total Maximum Daily Load
Laguna/San Joaquin	Load (Billion MPN/Yr)	12,163	30,374	2,924	199	0	997	26,585	0	0	6,912	199	584,213	0	664,634
	% Load	1.83%	4.57%	0.44%	0.03%	0.00%	0.15%	4.00%	0.00%	0.00%	1.04%	0.03%	87.90%	0.00%	100%
Aliso Creek	Load (Billion MPN/Yr)	70,269	183,330	18,791	1,263	0	5,053	307,288	14,527	0	9,317	24,949	943,970	0	1,579,074
	% Load	4.45%	11.61%	1.19%	0.08%	0.00%	0.32%	19.46%	0.92%	0.00%	0.59%	1.58%	59.78%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	26,035	72,029	1,962	0	0	2,075	65,124	0	0	0	23,469	186,581	0	377,313
	% Load	6.90%	19.09%	0.52%	0.00%	0.00%	0.55%	17.26%	0.00%	0.00%	0.00%	6.22%	49.45%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	208,951	245,738	47,087	5,886	0	11,772	756,342	2,998,883	0	150,091	211,894	10,076,718	0	14,714,833
	% Load	1.42%	1.67%	0.32%	0.04%	0.00%	0.08%	5.14%	20.38%	0.00%	1.02%	1.44%	68.48%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	36,266	73,083	6,895	2,068	276	2,896	123,001	414	0	0	36,680	1,097,215	0	1,378,930
	% Load	2.63%	5.30%	0.50%	0.15%	0.02%	0.21%	8.92%	0.03%	0.00%	0.00%	2.66%	79.57%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	275,786	139,516	22,712	6,489	444,503	9,734	29,201	18,896,242	1,369,199	0	87,603	11,164,486	0	32,445,470
	% Load	0.85%	0.43%	0.07%	0.02%	1.37%	0.03%	0.09%	58.24%	4.22%	0.00%	0.27%	34.41%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	1,331	3,881	753	33	0	153	532	3,493	5,742	0	899	408	0	17,224
	% Load	7.73%	22.53%	4.37%	0.19%	0.00%	0.89%	3.09%	20.28%	33.34%	0.00%	5.22%	2.37%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	377,810	120,308	54,877	4,221	0	8,443	238,506	10,644,100	1,127,097	0	147,747	8,383,574	0	21,106,683
	% Load	1.79%	0.57%	0.26%	0.02%	0.00%	0.04%	1.13%	50.43%	5.34%	0.00%	0.70%	39.72%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	1,298	5,357	49	1	0	45	0	0	0	0	0	3,506	0	10,256
	% Load	12.66%	52.23%	0.48%	0.01%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	34.18%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	24,254	74,106	9,588	35	0	814	2,530	0	0	0	17,390	48,189	0	176,906
	% Load	13.71%	41.89%	5.42%	0.02%	0.00%	0.46%	1.43%	0.00%	0.00%	0.00%	9.83%	27.24%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	167,117	191,927	53,833	5,149	8,894	6,085	16,852	340,788	52,897	0	39,790	3,798,285	0	4,681,150
	% Load	3.57%	4.10%	1.15%	0.11%	0.19%	0.13%	0.36%	7.28%	1.13%	0.00%	0.85%	81.14%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	101,069	140,571	34,193	2,186	937	2,290	8,952	0	0	0	29,769	200,369	0	520,440
	% Load	19.42%	27.01%	6.57%	0.42%	0.18%	0.44%	1.72%	0.00%	0.00%	0.00%	5.72%	38.50%	0.00%	100%

Table I-10 Distribution of Allowable Total Coliform Loads by Land Use Using Interim Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/ Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Total Maximum Daily Load
Laguna/San Joaquin	Load (Billion MPN/Yr)	336,543	672,342	195,821	6,701	0	27,549	268,043	0	0	46,163	2,234	5,889,509	0	7,445,650
	% Load	4.52%	9.03%	2.63%	0.09%	0%	0.37%	3.60%	0%	0%	0.62%	0.03%	79.10%	0%	100%
Aliso Creek	Load (Billion MPN/Yr)	1,916,107	4,001,816	1,235,677	50,477	0	139,317	3,056,887	94,897	0	60,572	248,347	9,386,702	0	20,190,798
	% Load	9.49%	19.82%	6.12%	0.25%	0.00%	0.69%	15.14%	0.47%	0.00%	0.30%	1.23%	46.49%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	822,693	1,822,108	149,581	603	0	66,346	750,315	0	0	0	270,210	2,149,617	0	6,031,472
	% Load	13.64%	30.21%	2.48%	0.01%	0.00%	1.10%	12.44%	0.00%	0.00%	0.00%	4.48%	35.64%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	4,829,152	4,534,242	2,617,327	221,183	0	270,334	6,365,142	16,625,555	0	835,579	1,781,748	84,798,935	0	122,879,198
	% Load	3.93%	3.69%	2.13%	0.18%	0.00%	0.22%	5.18%	13.53%	0.00%	0.68%	1.45%	69.01%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	954,298	1,537,480	439,280	81,797	3,030	77,253	1,179,997	1,515	0	0	351,424	10,520,001	0	15,147,590
	% Load	6.30%	10.15%	2.90%	0.54%	0.02%	0.51%	7.79%	0.01%	0.00%	0.00%	2.32%	69.45%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	6,456,648	2,600,594	1,300,297	224,189	3,788,797	201,770	246,608	105,929,376	7,667,269	0	762,243	95,033,783	0	224,189,156
	% Load	2.88%	1.16%	0.58%	0.10%	1.69%	0.09%	0.11%	47.25%	3.42%	0.00%	0.34%	42.39%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	60,659	141,425	82,254	2,210	0	7,014	8,842	38,215	62,785	0	14,920	6,759	0	425,083
	% Load	14.27%	33.27%	19.35%	0.52%	0.00%	1.65%	2.08%	8.99%	14.77%	0.00%	3.51%	1.59%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	9,086,789	2,319,691	3,215,571	127,983	0	223,970	2,079,723	61,527,797	6,511,132	0	1,295,827	73,574,191	0	159,978,672
	% Load	5.68%	1.45%	2.01%	0.08%	0.00%	0.14%	1.30%	38.46%	4.07%	0.00%	0.81%	45.99%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	38,842	128,190	3,531	42	0	1,345	0	0	0	0	0	38,232	0	210,182
	% Load	18.48%	60.99%	1.68%	0.02%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	18.19%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	799,069	1,953,666	757,677	1,743	0	26,578	30,499	0	0	0	208,699	578,606	0	4,356,972
	% Load	18.34%	44.84%	17.39%	0.04%	0.00%	0.61%	0.70%	0.00%	0.00%	0.00%	4.79%	13.28%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	5,613,103	5,156,914	4,356,931	251,234	105,783	198,343	211,566	2,750,354	429,743	0	482,634	46,551,067	0	66,114,283
	% Load	8.49%	7.80%	6.59%	0.38%	0.16%	0.30%	0.32%	4.16%	0.65%	0.00%	0.73%	70.41%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	3,444,383	3,832,538	2,799,223	111,280	11,923	78,161	111,280	0	0	0	369,609	2,489,229	0	13,247,626
	% Load	26.00%	28.93%	21.13%	0.84%	0.09%	0.59%	0.84%	0.00%	0.00%	0.00%	2.79%	18.79%	0.00%	100%

Table I-11 Distribution of Allowable Enterococci Loads by Land Use Using Interim Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Total Maximum Daily Load
Laguna/San Joaquin	Load (Billion MPN/Yr)	43,054	26,850	21,840	313	0	3,523	29,903	0	0	2,896	235	654,184	0	782,798
	% Load	5.50%	3.43%	2.79%	0.04%	0%	0.45%	3.82%	0%	0%	0.37%	0.03%	83.57%	0%	100%
Aliso Creek	Load (Billion MPN/Yr)	241,141	157,249	135,983	2,341	0	17,559	334,008	6,048	0	3,902	27,119	1,025,825	0	1,950,980
	% Load	12.36%	8.06%	6.97%	0.12%	0.00%	0.90%	17.12%	0.31%	0.00%	0.20%	1.39%	52.58%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	87,561	60,608	13,962	46	0	7,027	69,346	0	0	0	25,011	198,745	0	462,306
	% Load	18.94%	13.11%	3.02%	0.01%	0.00%	1.52%	15.00%	0.00%	0.00%	0.00%	5.41%	42.99%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	596,685	174,995	283,152	10,937	0	34,027	682,967	1,026,882	0	51,040	192,009	9,100,967	0	12,152,446
	% Load	4.91%	1.44%	2.33%	0.09%	0.00%	0.28%	5.62%	8.45%	0.00%	0.42%	1.58%	74.89%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	120,365	60,495	48,302	3,908	313	9,692	129,119	156	0	0	38,454	1,152,068	0	1,563,186
	% Load	7.70%	3.87%	3.09%	0.25%	0.02%	0.62%	8.26%	0.01%	0.00%	0.00%	2.46%	73.70%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	740,757	94,342	129,283	8,735	377,367	22,712	24,459	6,079,799	440,261	0	75,124	9,477,848	0	17,470,687
	% Load	4.24%	0.54%	0.74%	0.05%	2.16%	0.13%	0.14%	34.80%	2.52%	0.00%	0.43%	54.25%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	7,642	5,568	9,066	102	0	883	966	2,407	3,956	0	1,635	742	0	32,966
	% Load	23.18%	16.89%	27.50%	0.31%	0.00%	2.68%	2.93%	7.30%	12.00%	0.00%	4.96%	2.25%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	1,143,324	91,695	355,319	5,731	0	28,655	227,805	3,872,686	409,763	0	141,841	8,050,546	0	14,327,364
	% Load	7.98%	0.64%	2.48%	0.04%	0.00%	0.20%	1.59%	27.03%	2.86%	0.00%	0.99%	56.19%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	3,800	3,920	303	1	0	131	0	0	0	0	0	3,249	0	11,405
	% Load	33.32%	34.37%	2.66%	0.01%	0.00%	1.15%	0.00%	0.00%	0.00%	0.00%	0.00%	28.49%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	92,123	70,380	76,439	65	0	3,078	3,046	0	0	0	20,933	57,970	0	324,033
	% Load	28.43%	21.72%	23.59%	0.02%	0.00%	0.95%	0.94%	0.00%	0.00%	0.00%	6.46%	17.89%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	684,233	196,437	464,725	11,206	11,865	24,390	22,412	167,433	26,367	0	51,416	4,931,358	0	6,591,843
	% Load	10.38%	2.98%	7.05%	0.17%	0.18%	0.37%	0.34%	2.54%	0.40%	0.00%	0.78%	74.81%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	405,039	140,853	287,931	4,841	1,153	9,221	11,411	0	0	0	37,807	254,273	0	1,152,645
	% Load	35.14%	12.22%	24.98%	0.42%	0.10%	0.80%	0.99%	0.00%	0.00%	0.00%	3.28%	22.06%	0.00%	100%

Table I-12 Distribution of Allowable Fecal Coliform Loads by Land Use Using Final Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/ Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	**Total Maximum Daily Load**
Laguna/San Joaquin	Load (Billion MPN/Yr)	294	733	71	5	0	24	642	0	0	167	5	14,101	0	16,042
	% Load	1.83%	4.57%	0.44%	0.03%	0%	0.15%	4.00%	0%	0%	1.04%	0.03%	87.90%	0%	100%
Aliso Creek	Load (Billion MPN/Yr)	3,763	9,818	1,006	68	0	271	16,456	778	0	499	1,336	50,551	0	84,562
	% Load	4.45%	11.61%	1.19%	0.08%	0.00%	0.32%	19.46%	0.92%	0.00%	0.59%	1.58%	59.78%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	1,028	2,843	77	0	0	82	2,571	0	0	0	926	7,365	0	14,894
	% Load	6.90%	19.09%	0.52%	0.00%	0.00%	0.55%	17.26%	0.00%	0.00%	0.00%	6.22%	49.45%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	5,089	5,985	1,147	143	0	287	18,422	73,044	0	3,656	5,161	245,439	0	358,410
	% Load	1.42%	1.67%	0.32%	0.04%	0.00%	0.08%	5.14%	20.38%	0.00%	1.02%	1.44%	68.48%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	959	1,933	182	55	7	77	3,254	11	0	0	970	29,028	0	36,481
	% Load	2.63%	5.30%	0.50%	0.15%	0.02%	0.21%	8.92%	0.03%	0.00%	0.00%	2.66%	79.57%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	5,455	2,760	449	128	8,793	193	578	373,798	27,085	0	1,733	220,851	0	641,823
	% Load	0.85%	0.43%	0.07%	0.02%	1.37%	0.03%	0.09%	58.24%	4.22%	0.00%	0.27%	34.41%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	121	351	68	3	0	14	48	316	520	0	81	37	0	1,559
	% Load	7.73%	22.53%	4.37%	0.19%	0.00%	0.89%	3.09%	20.28%	33.34%	0.00%	5.22%	2.37%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	7,715	2,457	1,121	86	0	172	4,870	217,355	23,016	0	3,017	171,195	0	431,004
	% Load	1.79%	0.57%	0.26%	0.02%	0.00%	0.04%	1.13%	50.43%	5.34%	0.00%	0.70%	39.72%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	39	163	1	0	0	1	0	0	0	0	0	107	0	312
	% Load	12.66%	52.23%	0.48%	0.01%	0.00%	0.44%	0.00%	0.00%	0.00%	0.00%	0.00%	34.18%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	1,416	4,327	560	2	0	48	148	0	0	0	1,015	2,814	0	10,329
	% Load	13.71%	41.89%	5.42%	0.02%	0.00%	0.46%	1.43%	0.00%	0.00%	0.00%	9.83%	27.24%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	11,107	12,756	3,578	342	591	404	1,120	22,650	3,516	0	2,645	252,453	0	311,132
	% Load	3.57%	4.10%	1.15%	0.11%	0.19%	0.13%	0.36%	7.28%	1.13%	0.00%	0.85%	81.14%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	10,781	14,995	3,647	233	100	244	955	0	0	0	3,176	21,374	0	55,516
	% Load	19.42%	27.01%	6.57%	0.42%	0.18%	0.44%	1.72%	0.00%	0.00%	0.00%	5.72%	38.50%	0.00%	100%

Table I-13 Distribution of Allowable Total Coliform Loads by Land Use Using Final Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/ Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Total Maximum Daily Load
Laguna/San Joaquin	Load (Billion MPN/Yr)	418	834	243	8	0	34	333	0	0	57	3	7,307	0	9,238
	% Load	4.52%	9.03%	2.63%	0.09%	0%	0.37%	3.60%	0%	0%	0.62%	0.03%	79.10%	0%	100%
Aliso Creek	Load (Billion MPN/Yr)	5,469	11,422	3,527	144	0	398	8,725	271	0	173	709	26,792	0	57,629
	% Load	9.49%	19.82%	6.12%	0.25%	0.00%	0.69%	15.14%	0.47%	0.00%	0.30%	1.23%	46.49%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	1,144	2,534	208	1	0	92	1,043	0	0	0	376	2,989	0	8,387
	% Load	13.64%	30.21%	2.48%	0.01%	0.00%	1.10%	12.44%	0.00%	0.00%	0.00%	4.48%	35.64%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	351,622	330,149	190,574	16,105	0	19,684	463,461	1,210,545	0	60,840	129,733	6,174,403	0	8,947,114
	% Load	3.93%	3.69%	2.13%	0.18%	0.00%	0.22%	5.18%	13.53%	0.00%	0.68%	1.45%	69.01%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	1,323	2,131	609	113	4	107	1,636	2	0	0	487	14,583	0	20,998
	% Load	6.30%	10.15%	2.90%	0.54%	0.02%	0.51%	7.79%	0.01%	0.00%	0.00%	2.32%	69.45%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	12,682	5,108	2,554	440	7,442	396	484	208,064	15,060	0	1,497	186,663	0	440,347
	% Load	2.88%	1.16%	0.58%	0.10%	1.69%	0.09%	0.11%	47.25%	3.42%	0.00%	0.34%	42.39%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	128	299	174	5	0	15	19	81	133	0	32	14	0	899
	% Load	14.27%	33.27%	19.35%	0.52%	0.00%	1.65%	2.08%	8.99%	14.77%	0.00%	3.51%	1.59%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	26,235	6,697	9,284	370	0	647	6,005	177,641	18,799	0	3,741	212,421	0	461,886
	% Load	5.68%	1.45%	2.01%	0.08%	0.00%	0.14%	1.30%	38.46%	4.07%	0.00%	0.81%	45.99%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	34	111	3	0	0	1	0	0	0	0	0	33	0	182
	% Load	18.48%	60.99%	1.68%	0.02%	0.00%	0.64%	0.00%	0.00%	0.00%	0.00%	0.00%	18.19%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	1,089	2,663	1,033	2	0	36	42	0	0	0	285	789	0	5,940
	% Load	18.34%	44.84%	17.39%	0.04%	0.00%	0.61%	0.70%	0.00%	0.00%	0.00%	4.79%	13.28%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	16,101	14,793	12,498	721	303	569	607	7,889	1,233	0	1,384	133,533	0	189,650
	% Load	8.49%	7.80%	6.59%	0.38%	0.16%	0.30%	0.32%	4.16%	0.65%	0.00%	0.73%	70.41%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	360,370	400,981	292,870	11,643	1,247	8,178	11,643	0	0	0	38,670	260,436	0	1,386,037
	% Load	26.00%	28.93%	21.13%	0.84%	0.09%	0.59%	0.84%	0.00%	0.00%	0.00%	2.79%	18.79%	0.00%	100%

Table I-14 Distribution of Allowable Enterococci Loads by Land Use Using Final Numeric Targets

Watershed	Measure/Unit	Low Density Residential	High Density Residential	Commercial/ Institutional	Industrial/ Transport	Military	Parks/ Rec	Transitional	Agriculture	Dairy/ Intensive Livestock	Horse Ranches	Open Rec	Open Space	Water	Total Maximum Daily Load
Laguna/San Joaquin	Load (Billion MPN/Yr)	230	143	116	2	0	19	159	0	0	15	1	3,489	0	4,175
	% Load	5.50%	3.43%	2.79%	0.04%	0%	0.45%	3.82%	0%	0%	0.37%	0.03%	83.57%	0%	100%
Aliso Creek	Load (Billion MPN/Yr)	1,694	1,105	955	16	0	123	2,346	42	0	27	190	7,206	0	13,704
	% Load	12.36%	8.06%	6.97%	0.12%	0.00%	0.90%	17.12%	0.31%	0.00%	0.20%	1.39%	52.58%	0.00%	100%
Dana Point	Load (Billion MPN/Yr)	734	508	117	0	0	59	581	0	0	0	210	1,666	0	3,875
	% Load	18.94%	13.11%	3.02%	0.01%	0.00%	1.52%	15.00%	0.00%	0.00%	0.00%	5.41%	42.99%	0.00%	100%
San Juan Creek	Load (Billion MPN/Yr)	2,755	808	1,308	51	0	157	3,154	4,742	0	236	887	42,028	0	56,119
	% Load	4.91%	1.44%	2.33%	0.09%	0.00%	0.28%	5.62%	8.45%	0.00%	0.42%	1.58%	74.89%	0.00%	100%
San Clemente	Load (Billion MPN/Yr)	731	367	293	24	2	59	784	1	0	0	234	6,996	0	9,492
	% Load	7.70%	3.87%	3.09%	0.25%	0.02%	0.62%	8.26%	0.01%	0.00%	0.00%	2.46%	73.70%	0.00%	100%
San Luis Rey River	Load (Billion MPN/Yr)	7,387	941	1,289	87	3,763	226	244	60,629	4,390	0	749	94,515	0	174,221
	% Load	4.24%	0.54%	0.74%	0.05%	2.16%	0.13%	0.14%	34.80%	2.52%	0.00%	0.43%	54.25%	0.00%	100%
San Marcos	Load (Billion MPN/Yr)	94	69	112	1	0	11	12	30	49	0	20	9	0	406
	% Load	23.18%	16.89%	27.50%	0.31%	0.00%	2.68%	2.93%	7.30%	12.00%	0.00%	4.96%	2.25%	0.00%	100%
San Dieguito River	Load (Billion MPN/Yr)	10,815	867	3,361	54	0	271	2,155	36,634	3,876	0	1,342	76,154	0	135,530
	% Load	7.98%	0.64%	2.48%	0.04%	0.00%	0.20%	1.59%	27.03%	2.86%	0.00%	0.99%	56.19%	0.00%	100%
Miramar	Load (Billion MPN/Yr)	27	28	2	0	0	1	0	0	0	0	0	23	0	81
	% Load	33.32%	34.37%	2.66%	0.01%	0.00%	1.15%	0.00%	0.00%	0.00%	0.00%	0.00%	28.49%	0.00%	100%
Scripps	Load (Billion MPN/Yr)	764	583	634	1	0	26	25	0	0	0	174	481	0	2,686
	% Load	28.43%	21.72%	23.59%	0.02%	0.00%	0.95%	0.94%	0.00%	0.00%	0.00%	6.46%	17.89%	0.00%	100%
San Diego River	Load (Billion MPN/Yr)	5,019	1,441	3,409	82	87	179	164	1,228	193	0	377	36,175	0	48,356
	% Load	10.38%	2.98%	7.05%	0.17%	0.18%	0.37%	0.34%	2.54%	0.40%	0.00%	0.78%	74.81%	0.00%	100%
Chollas Creek	Load (Billion MPN/Yr)	3,188	1,109	2,266	38	9	73	90	0	0	0	298	2,002	0	9,073
	% Load	35.14%	12.22%	24.98%	0.42%	0.10%	0.80%	0.99%	0.00%	0.00%	0.00%	3.28%	22.06%	0.00%	100%

Table I-15. Distribution of Allowable Fecal Coliform Loads between Industrial/ Transportation and Caltrans Using Interim Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.11 199		0.19 199
Aliso Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.89 1,263	0.72 80.90% 1,022	0.17 19.10% 241
Dana Point	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.01 0		0.06 0
San Juan Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.9 5,886	2.17 74.83% 4,404	0.73 25.17% 1,482
San Clemente	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.17 2,068	0.99 84.62% 1,750	0.18 15.38% 318
San Luis Rey River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	4.92 6,489	3.75 76.22% 4,946	1.17 23.78% 1,543
San Marcos	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 33	0.04 80.00% 26	0.01 20.00% 7
San Dieguito River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.22 4,221	1.44 64.86% 2,738	0.78 35.14% 1,483
Miramar	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	3.28 1	2.54 77.44% 1	0.74 22.56% 0
Scripps	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 35	0.05 100.00% 35	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	10.07 5,149	8.13 80.73% 4,157	1.94 19.27% 992
Chollas Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.61 2,186	1.04 64.60% 1,412	0.57 35.40% 774

Table I-16. Distribution of Allowable Total Coliform Loads between Industrial/ Transportation and Caltrans Using Interim Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.11 6,701		0.19 6,701
Aliso Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.89 50,477	0.72 80.90% 40,835	0.17 19.10% 9,642
Dana Point	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.01 603		0.06 603
San Juan Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.9 221,183	2.17 74.83% 165,506	0.73 25.17% 55,677
San Clemente	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.17 81,797	0.99 84.62% 69,213	0.18 15.38% 12,584
San Luis Rey River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	4.92 224,189	3.75 76.22% 170,876	1.17 23.78% 53,313
San Marcos	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 2,210	0.04 80.00% 1,768	0.01 20.00% 442
San Dieguito River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.22 127,983	1.44 64.86% 83,016	0.78 35.14% 44,967
Miramar	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	3.28 42	2.54 77.44% 33	0.74 22.56% 9
Scripps	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 1,743	0.05 100.00% 1,743	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	10.07 251,234	8.13 80.73% 202,834	1.94 19.27% 48,401
Chollas Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.61 111,280	1.04 64.60% 71,883	0.57 35.40% 39,397

Table I-17. Distribution of Allowable Enterococci Loads between Industrial/ Transportation and Caltrans Using Interim Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.11 313		0.19 313
Aliso Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.89 2,341	0.72 80.90% 1,894	0.17 19.10% 447
Dana Point	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.01 46		0.06 46
San Juan Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.9 10,937	2.17 74.83% 8,184	0.73 25.17% 2,753
San Clemente	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.17 3,908	0.99 84.62% 3,307	0.18 15.38% 601
San Luis Rey River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	4.92 8,735	3.75 76.22% 6,658	1.17 23.78% 2,077
San Marcos	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 102	0.04 80.00% 82	0.01 20.00% 20
San Dieguito River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	2.22 5,731	1.44 64.86% 3,717	0.78 35.14% 2,014
Miramar	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	3.28 1	2.54 77.44% 1	0.74 22.56% 0
Scripps	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	0.05 65	0.05 100.00% 65	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	10.07 11,206	8.13 80.73% 9,047	1.94 19.27% 2,159
Chollas Creek	Area (sq miles) % Area of Ind./Trans Load (Billion MPN/Yr)	1.61 4,841	1.04 64.60% 3,127	0.57 35.40% 1,714

Table I-18. Distribution of Allowable Fecal Coliform Loads between Industrial/ Transport and Caltrans Using Final Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.11 5		0.19 5
Aliso Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.89 68	0.72 80.90% 55	0.17 19.10% 13
Dana Point	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.01 0		0.06 0
San Juan Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.9 143	2.17 74.83% 107	0.73 25.17% 36
San Clemente	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.17 55	0.99 84.62% 46	0.18 15.38% 8
San Luis Rey River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	4.92 128	3.75 76.22% 98	1.17 23.78% 31
San Marcos	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 3	0.04 80.00% 2	0.01 20.00% 1
San Dieguito River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.22 86	1.44 64.86% 56	0.78 35.14% 30
Miramar	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	3.28 0	2.54 77.44% 0	0.74 22.56% 0
Scripps	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 2	0.05 100.00% 2	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	10.07 342	8.13 80.73% 276	1.94 19.27% 66
Chollas Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.61 233	1.04 64.60% 151	0.57 35.40% 83

Table I-19. Distribution of Allowable Total Coliform Loads between Industrial/ Transport and Caltrans Using Final Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.11 8		0.19 8
Aliso Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.89 144	0.72 80.90% 117	0.17 19.10% 28
Dana Point	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.01 1		0.06 1
San Juan Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.9 16,105	2.17 74.83% 12,051	0.73 25.17% 4,054
San Clemente	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.17 113	0.99 84.62% 96	0.18 15.38% 17
San Luis Rey River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	4.92 440	3.75 76.22% 336	1.17 23.78% 105
San Marcos	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 5	0.04 80.00% 4	0.01 20.00% 1
San Dieguito River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.22 370	1.44 64.86% 240	0.78 35.14% 130
Miramar	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	3.28 0	2.54 77.44% 0	0.74 22.56% 0
Scripps	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 2	0.05 100.00% 2	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	10.07 721	8.13 80.73% 582	1.94 19.27% 139
Chollas Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.61 11,643	1.04 64.60% 7,521	0.57 35.40% 4,122

Table I-20. Distribution of Allowable Enterococci Loads between Industrial/ Transport and Caltrans Using Final Numeric Targets

Watershed	Measure/Unit	Industrial/ Transport	Industrial/ Transport excluding Caltrans	Caltrans
Laguna/San Joaquin	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.11 2		0.19 2
Aliso Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.89 16	0.72 80.90% 13	0.17 19.10% 3
Dana Point	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.01 0		0.06 0
San Juan Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.9 51	2.17 74.83% 38	0.73 25.17% 13
San Clemente	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.17 24	0.99 84.62% 20	0.18 15.38% 4
San Luis Rey River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	 87	3.75 76.22% 66	1.17 23.78% 21
San Marcos	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 1	0.04 80.00% 1	0.01 20.00% 0
San Dieguito River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	2.22 54	1.44 64.86% 35	0.78 35.14% 19
Miramar	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	3.28 0	2.54 77.44% 0	0.74 22.56% 0
Scripps	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	0.05 1	0.05 100.00% 1	0 0.00% 0
San Diego River	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	10.07 82	8.13 80.73% 66	1.94 19.27% 16
Chollas Creek	Area (sq miles) % Area of Ind./ Trans. Load (Billion MPN/Yr)	1.61 38	1.04 64.60% 25	0.57 35.40% 13